SCIENCE & POLICY EXCHANGE

DIALOGUE SCIENCES & POLITIQUES

RETHINKING FEDERAL RESEARCH FUNDING:

Towards More Equitable Funding for Canada's Next Generation

REPENSER LE FINANCEMENT FÉDÉRAL DE LA RECHERCHE:

Vers un financement plus équitable pour la relève du Canada

COMPREHENSIVE REPORT / RAPPORT DÉTAILLÉ

Table of Contents

Introduction

Science & Policy Exchange (SPE) aims to promote the student and trainee voice in science policy decisions in part by providing graduate students and postdoctoral fellows a platform to voice their opinion. In the past, we have successfully campaigned for science policy issues, such as the implementation of the Fundamental Science Review, by galvanizing the student voice through our social media presence and collaborating with student-led groups across the country.

In 2018, the Government of Canada announced that "they will be doing further work to determine how to better support students, the next generation of researchers, through scholarships and fellowships." We at SPE noticed that the views of current trainees were underrepresented on this issue and thus, to this end, we decided to hear directly from current or recent graduate students and postdoctoral fellows about their views on the state of trainee awards. We launched a bilingual nation-wide survey in October 2018 that took into account federal awards exclusively from the Tri-Council Agencies: CIHR (Canadian Institute of Health Research), NSERC (Natural Sciences and Engineering Research Council), and SSHRC (Social Sciences and Humanities Research Council). We formulated questions that encompassed a range of issues. Some of our considerations include:

1. Early career researchers' (ECRs) opinion on the current state of funding,
2. The challenges faced by international students,
3. Issues faced by trainees with respect to equity, diversity and inclusion and,
4. Perspectives on potential adaptions to the federal funding system to centre sustainable ECR support

Over 1100 responses were collected between October 9th and January 15th, 2019. The SPE team gathered and analyzed the data as critically and objectively as possible, to best represent the needs of certain subpopulations of respondents and equity-seeking groups (notably women, Indigenous people and international students). Preliminary data was shared with several members of the government from the Ministers of Finance, Innovation Science and Economic Development, and Science and Sports ahead of Budget 2019 in the hope that the ECR voice could be acknowledged and included. In addition we were pleased to share our preliminary survey results with Research Canada, McGill University and other institutions. Although Budget 2019 did increase the number of federal awards and some benefits for students, many of the issues highlighted by participants in our survey, as well as recommendations from the Fundamental Science Review, remain unaddressed.

We have attached the list of our questions in the Appendix of this document and would be pleased to review the data under a different lens, would this be of use for our audiences and stakeholders.

Please note that all questions were optional, all data has been dis-aggregated to ensure anonymity of the participants, and quotes were submitted to an approval process before being shared publicly.

Preface: Intersectional Data Collection

Our survey collected demographic data pertaining to age, gender, equity, and caregiver status. The survey allowed participants to self-identify as a member of a visible minority, a person with disabilities, or an Indigenous person. We did not directly collect additional data regarding which racialized groups survey participants were a part, nor whether participants identified as part of the LGBTQ2SIA+ community. Participants were likewise permitted to add additional identifications in a box denoted “Other” where desired. Nonetheless, additional demographic information is pertinent to current political and media discussions surrounding anti-Black racism, as well as racism against Indigenous peoples, and other people of colour, as well as other forms of marginalization including homophobia, transphobia, and ableism.

SPE recognizes that we did not account for comprehensive data collection detailing each of these axes above during development of the survey. We commit to doing so in the future.

We recommend that continuing data collection surrounding the topics of federal research trainee funding, access to education, graduate school and post-doctoral training, and trainee mental health collect these demographic data to better measure and record impacts on specific communities, and to bolster evidence-based policy that will reduce marginalization in our education system.

Disclaimer: Report Intent, Use & Raw Data

This large-scale comprehensive report contains analysis of each of our full list of survey questions from a variety of angles. Data was disaggregated by field of study, along with disaggregation by self-identification within several equity-seeking groups mentioned in the preface above; specifically, we cross-analyzed by gender, Indigenous self-identification, and citizenship status.

For a panoptic view of our data, each of these analyses are included within the following report in a basic format: one graphic per question, described by a short legend including the count of responses received per each demographic within our cohort. These data are finalized, but the graphs are proffered in a simplified raw form for full documentation of the scope of our survey.

SPE welcomes coordination with stakeholder groups who wish to use this raw data, or to collaborate on other novel analyses using our existing dataset. Cleaned and anonymized data is available on our landing page. We also encourage consultation for formalizing versions of graphics and analyses within this comprehensive report for future reference or publications.

Contact us for inquiries: contact@sp-exchange.ca

Chapter I: Demographics

As presented in **Figure 1**, 80% of the survey respondents are current research trainees (graduate students and postdocs), all years of study are well represented across our cohort, which also includes a few former trainees. In addition, respondents originate from all provinces and territories in Canada, and currently studying or working in over 50 different institutes. We would like to however acknowledge the bias of respondents from McGill University which make up a third of the total participants. This imbalance is due to the social media dissemination strategy and SPE's network of contacts, mostly based in Montreal and Quebec in general due to the geographical location of our group. The same explanation can also be put forward when acknowledging the participant bias towards life and health sciences compared to social sciences and humanities, however we are proud to show that many different fields of study were represented in our cohort.

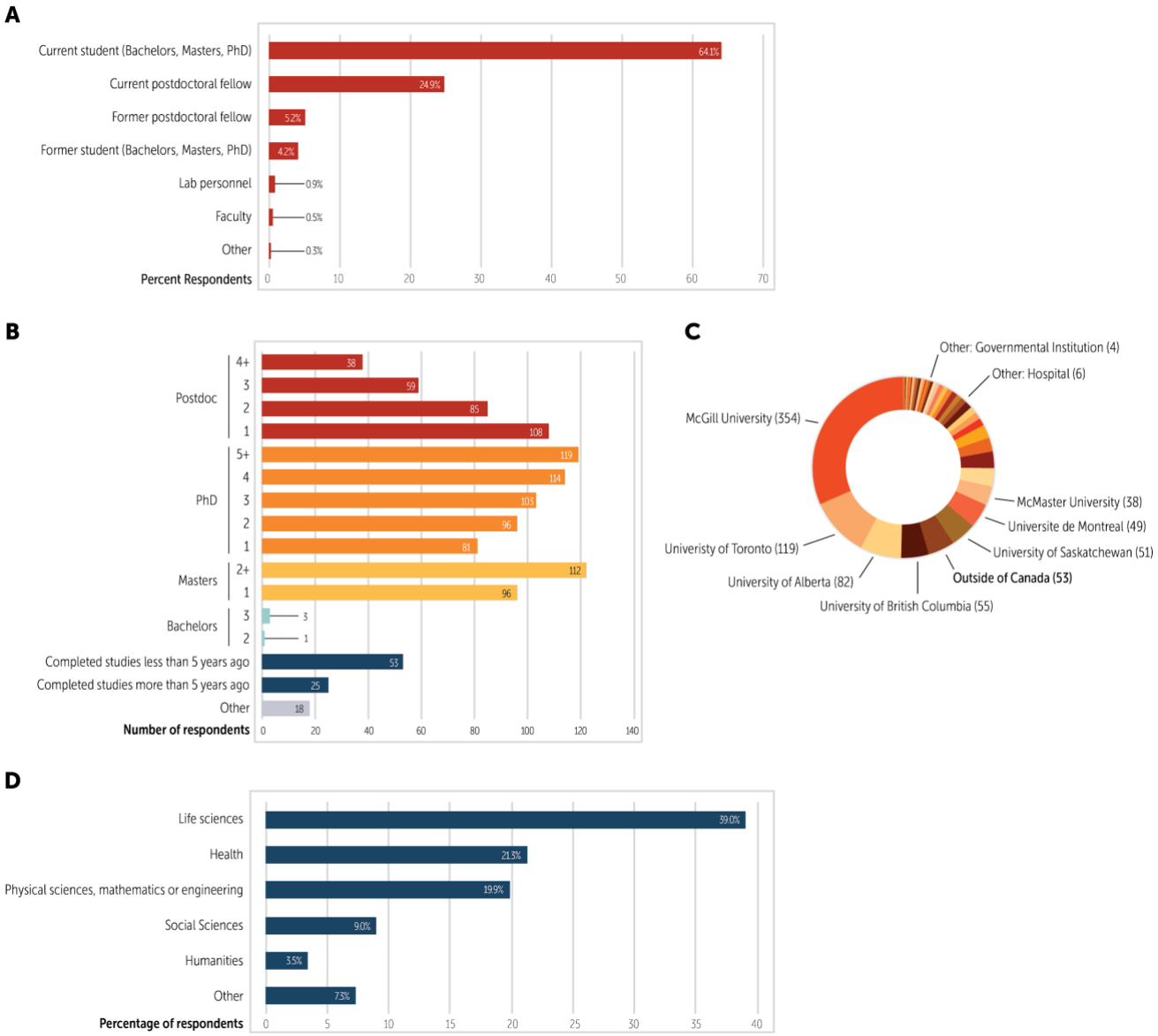


Figure 1: Education and employment status, university affiliation and program of study. A: Student, postdoctoral or employment status of survey respondents, by percent (n = 1126). B: Number of respondents in each current level of study (n

= 1121). C: University affiliation of respondents, through either employment or study (n = 1119). All registered Canadian universities listed as unique options (for a full list refer to Appendix III). D: Field of study / expertise of respondents, by percent (n = 1117). "Other" category includes multidisciplinary fields of interest that apply to 2 or more aforementioned fields. (figure on previous page)

In addition to a diverse cohort in terms of geographical location, field of study and education level, we also gathered answers from diverse backgrounds in terms of equity, diversity and inclusion (EDI) as well as age (**Figure 2**). About 20% of our respondents self-identified as being part of a visible minority, 3.4% self-identified as persons with disabilities and 1.16% (13 respondents) self-identified as indigenous people[1]. The slight majority of our respondents, 56%, define their gender as female, male respondents made up 41% of participants, and 12 identify as non-binary persons, or 1% of our cohort. We are aware that the representation of participants in some of those EDI groups is relatively small. SPE however believes that these self-identified groups are experiencing very specific issues and therefore decided to analyze our data under these different lenses to give them the voice they deserve and identify their specific concerns. For statistical transparency we included the number of participants for each of these minority groups at the beginning of the relevant sections.

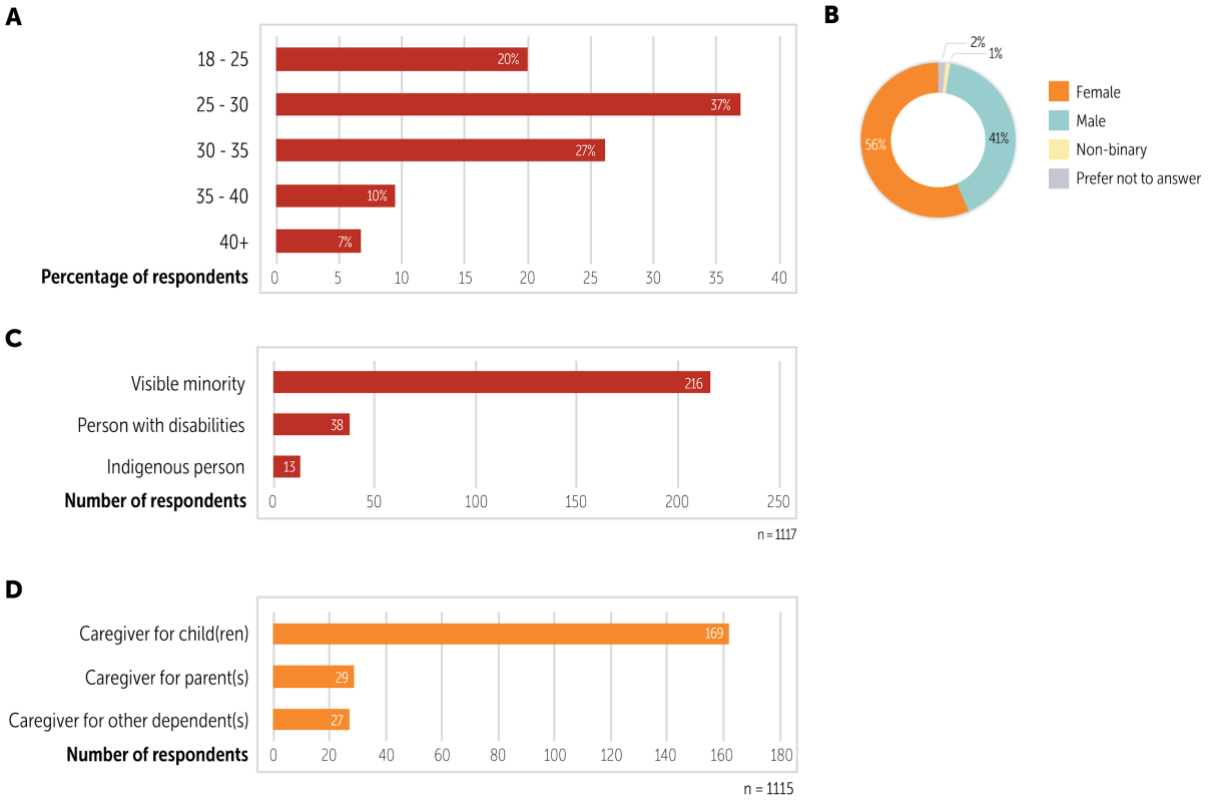


Figure 2: Age, gender, equity and caregiver status. A: Age category of survey respondents, by percent (n = 1103). B: Gender of all survey respondents, by percent (n = 1114). C: Number of respondents belonging to equity groups (visible minorities, persons with disabilities, indigenous persons) (n = 1117). D: Status of survey respondents as caregivers for dependents (child(ren), parent(s), or other dependents) (n = 1115).

[1] According to the definitions given by the Government of Canada Employment Equity Act, Government of Canada, https://www.canada.ca/en/public-service-commission/jobs/services/gc-jobs/employment-equity.html

Finally, a non-negligible number of students in Canadian universities and institutions are international, a representative 30% of our survey participants come from abroad (**Figure 3**). International students face very different personal-, career- and research-related challenges, notably regarding funding and government funding in particular. It was very important to us to highlight their concerns, as can be found in **Chapter IV** of this document.

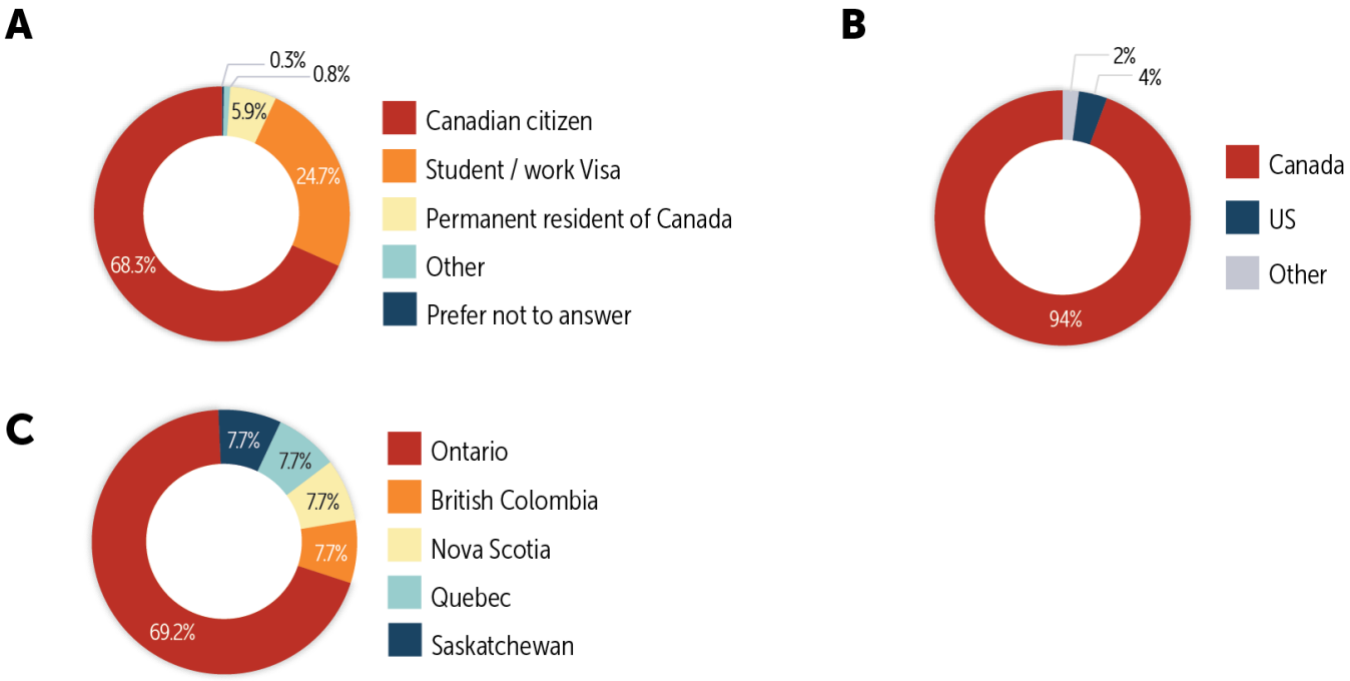


Figure 3: Citizenship status and country of residence. A: Current residency status of all survey respondents in Canada, by percent (n = 1120). B: Country in which respondents currently live, by percent (n = 1119). C: Province or territory in which non-university respondents' facility resides (n = 13).

Chapter II: General Analysis

Introduction

All respondents who *had* applied for a graduate or postdoctoral fellowship through the specified granting agencies of CIHR, NSERC and SSHRC, (756 respondents), were then asked a series of questions regarding their application experience and success (**Figures 4 - 7**). Conversely, those respondents who *had not* applied for a graduate or postdoctoral fellowship through the specified granting agencies (441 respondents) were asked about their lack of application to identify common barriers to the process (**Figure 8**).

Students and postdoctoral researchers with *successful* federal award applications (further denoted as "successful awardees") were queried about their application experience, award(s) obtained and the impact of the award (**Figures 9 - 16**).

Figures 17-27 present the opinions of all respondents regarding the perception of the current awards system. Respondents were also asked about the current valuation of the awards and their selection criteria. A subset of these questions refers specifically to the perception and valuation of the elite tri-council awards by students and early-career researchers (Vanier and Banting Awards for doctoral and postdoctoral students, respectively).

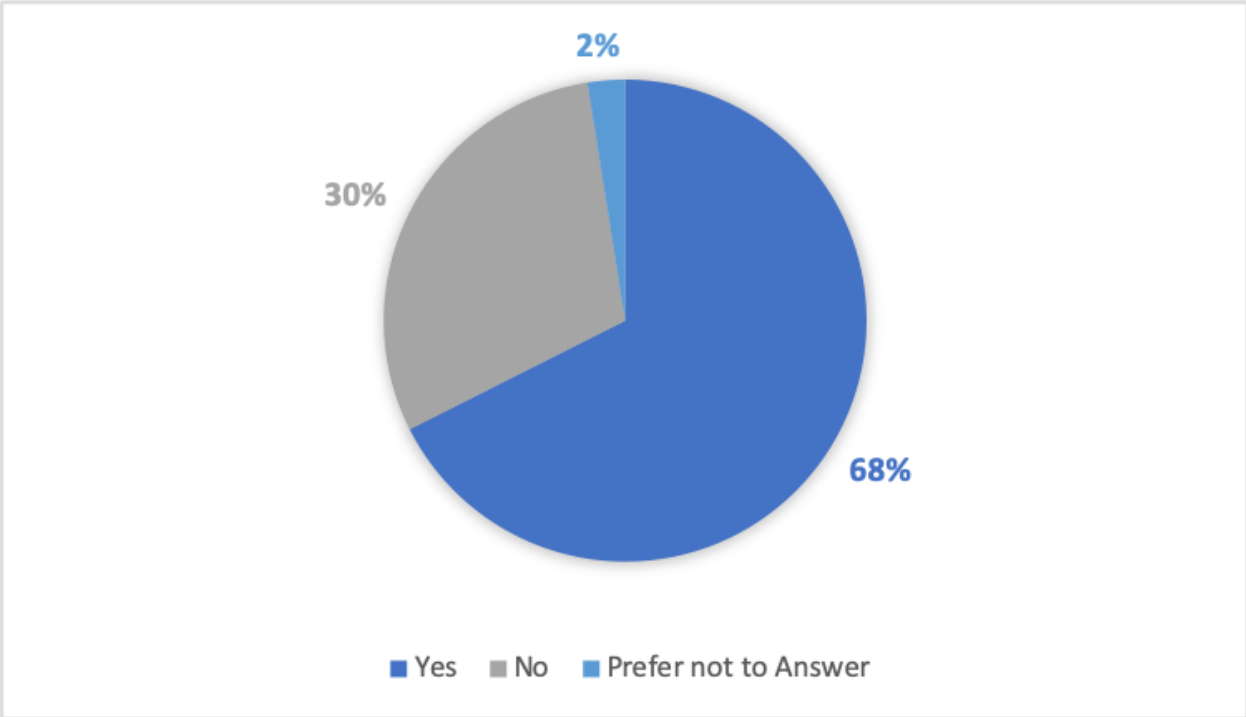


Figure 4: *Have you ever applied for a graduate or postdoctoral fellowship through CIHR, NSERC, or SSHRC?* (n = 1119).

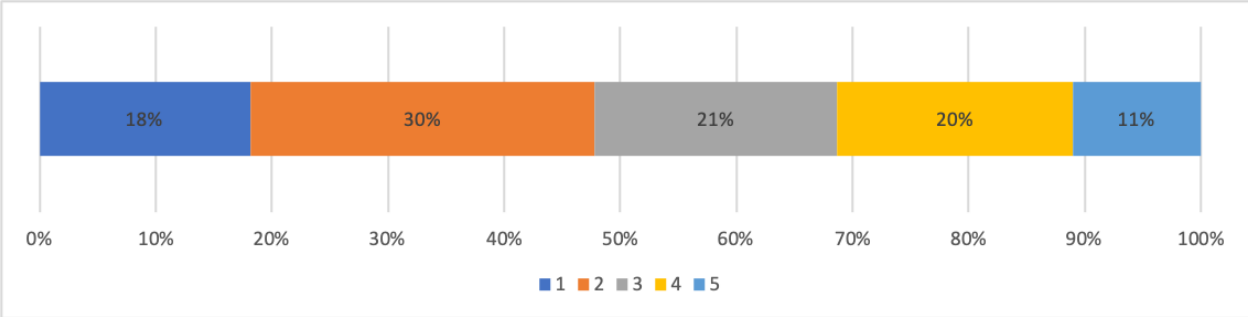


Figure 5: *I received adequate resources to help me complete my application*. Respondents were asked to state to what degree they agree with the previous statement by ranking agreeance from 1 - 5: 1 corresponds to strongly agree, 5 to strongly disagree (n = 756). Data shown by percent respondents.

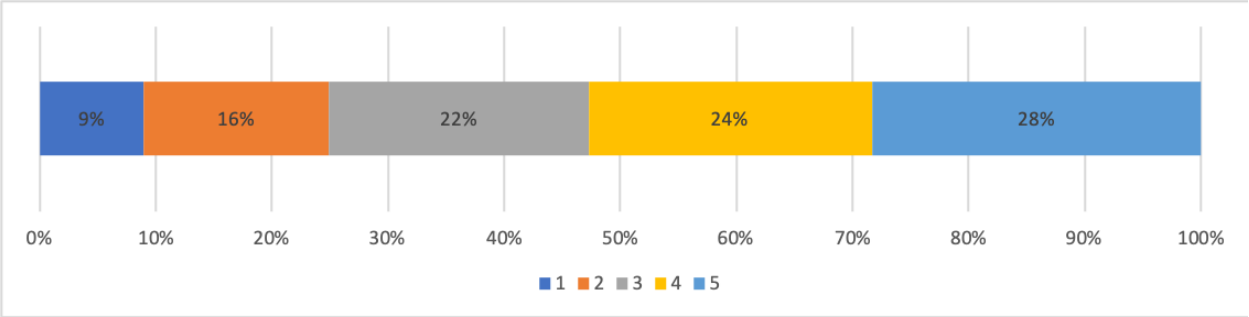


Figure 6: *I received useful feedback from my application, whether or not it was successful*. Respondents were asked to state to what degree they agree with the previous statement by ranking agreeance from 1 - 5: 1 corresponds to strongly agree, 5 to strongly disagree (n = 756). Data shown by percent respondents.

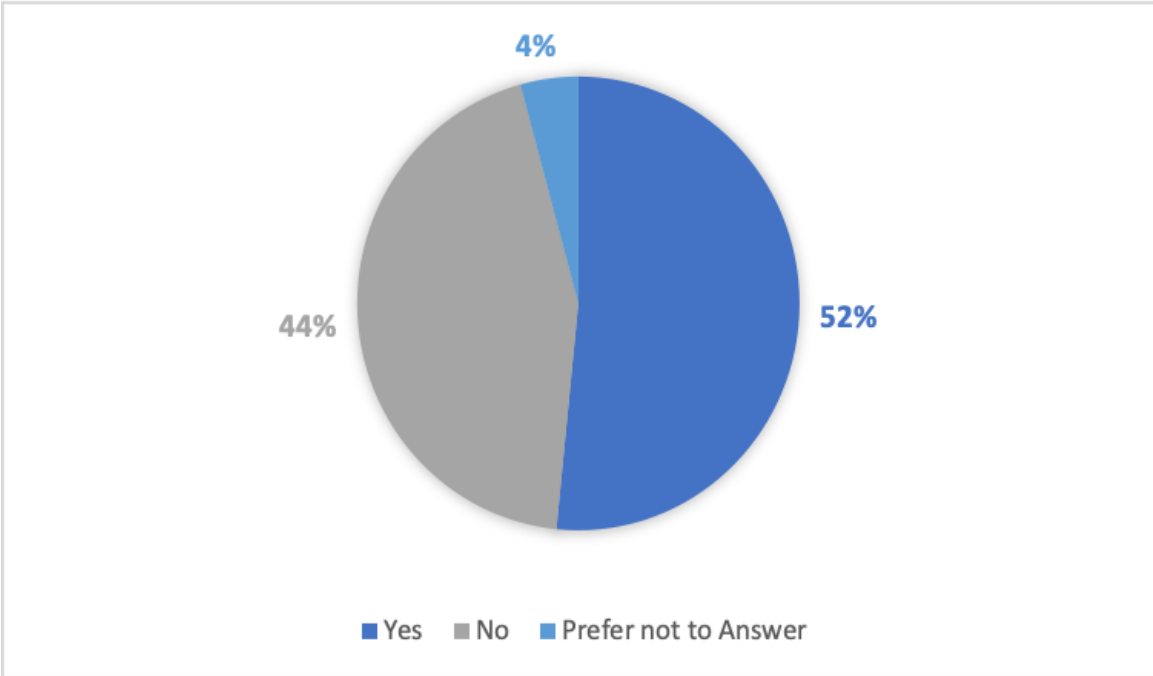


Figure 7: *Were any of your application(s) successful?* Percent of attendees with successful award applications (n = 756). 391 respondents had successful federal fellowship or scholarship applications.

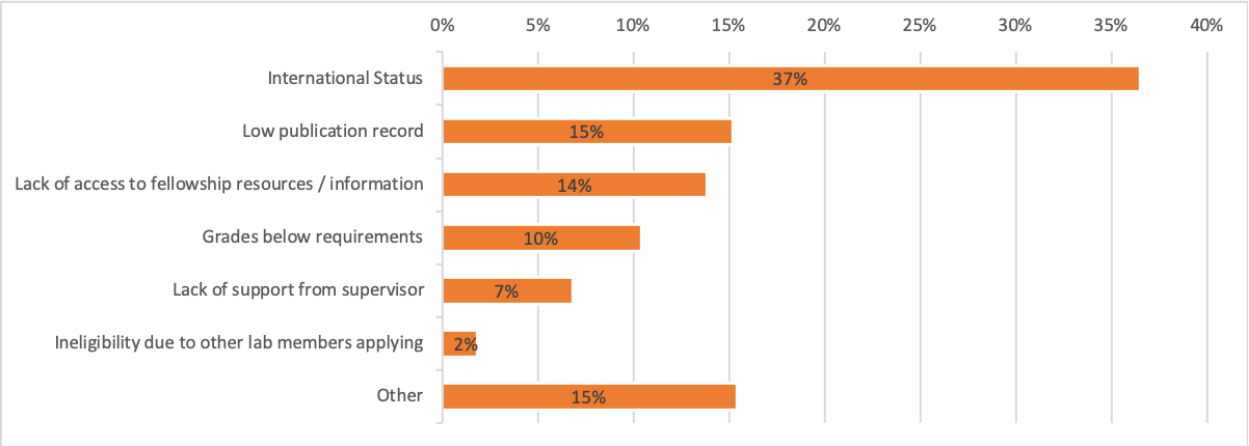


Figure 8: *What prevented you from applying?* Respondents were asked to indicate the reason that prevented them from applying for fellowships/scholarships. (n = 335).

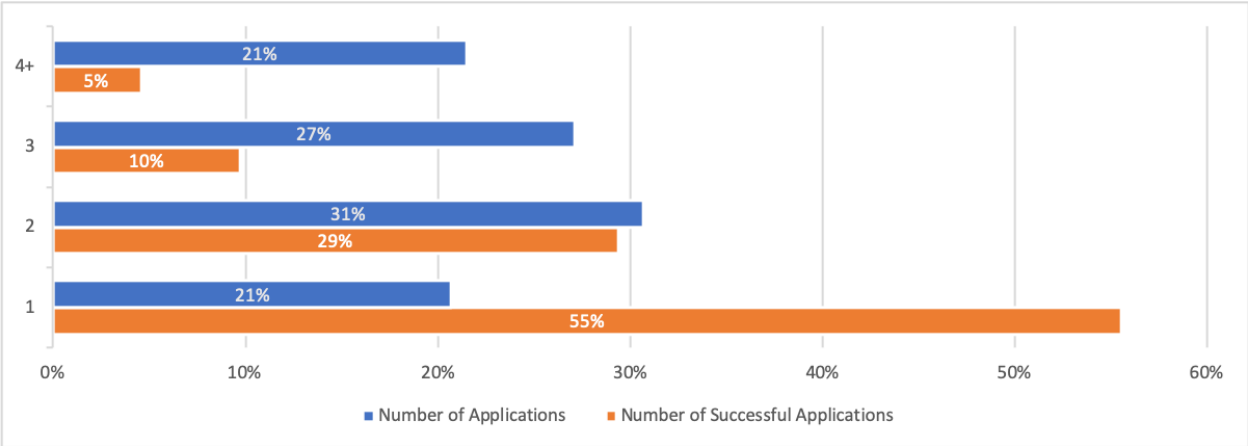


Figure 9: *Number of successful applications.* Successful awardees were queried how many federal fellowships or studentships they had applied to, and of those, how many were granted (n = 391).

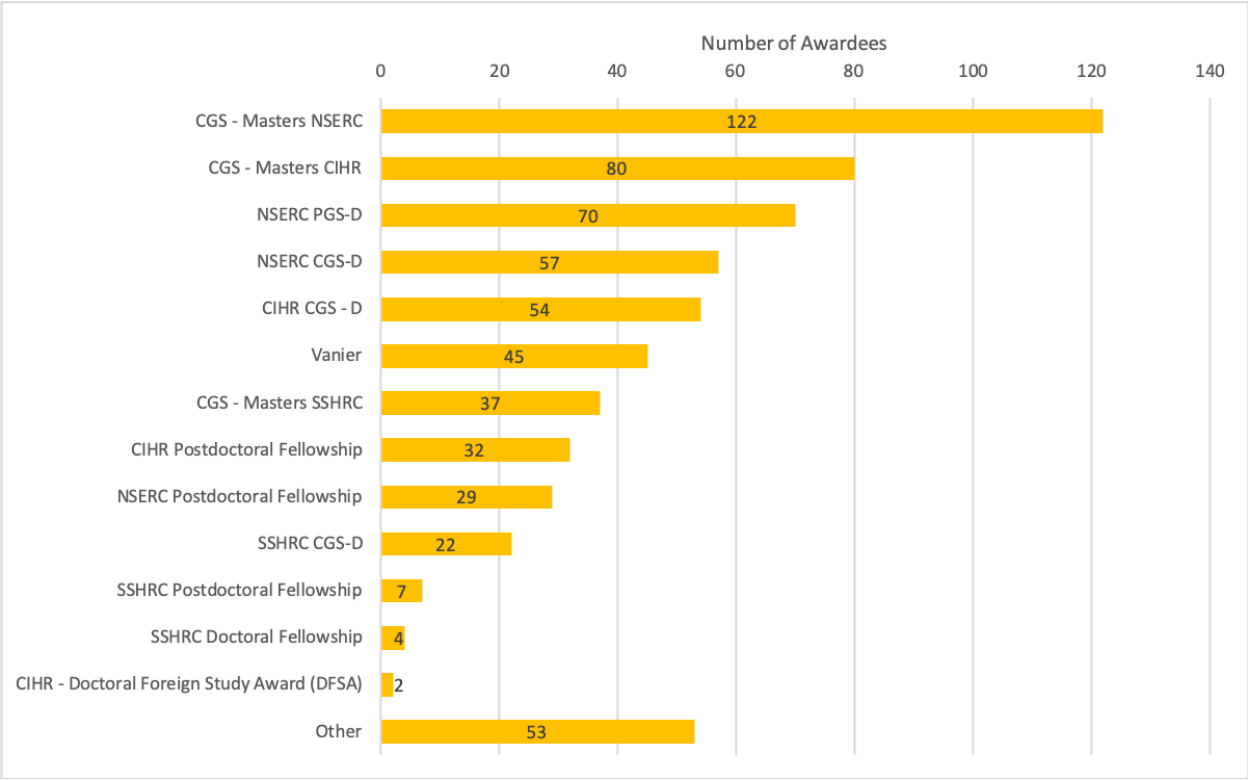


Figure 10: *Federal awards received.* Respondents noted which awards they successfully received, with more than one award per applicant possible (n = 392). 614 total awards received by the 392 successful awardees.

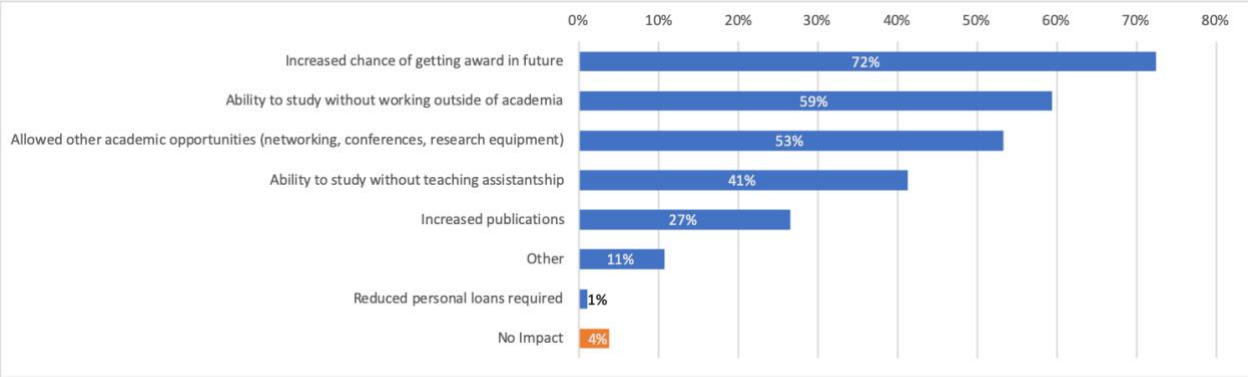


Figure 11: *What impact did receiving an award have on you and your research?* Benefits of receiving an award on successful awardees, by percent (n = 392). 4% of successful awardees cited no impact to their research environment, career or personal life.

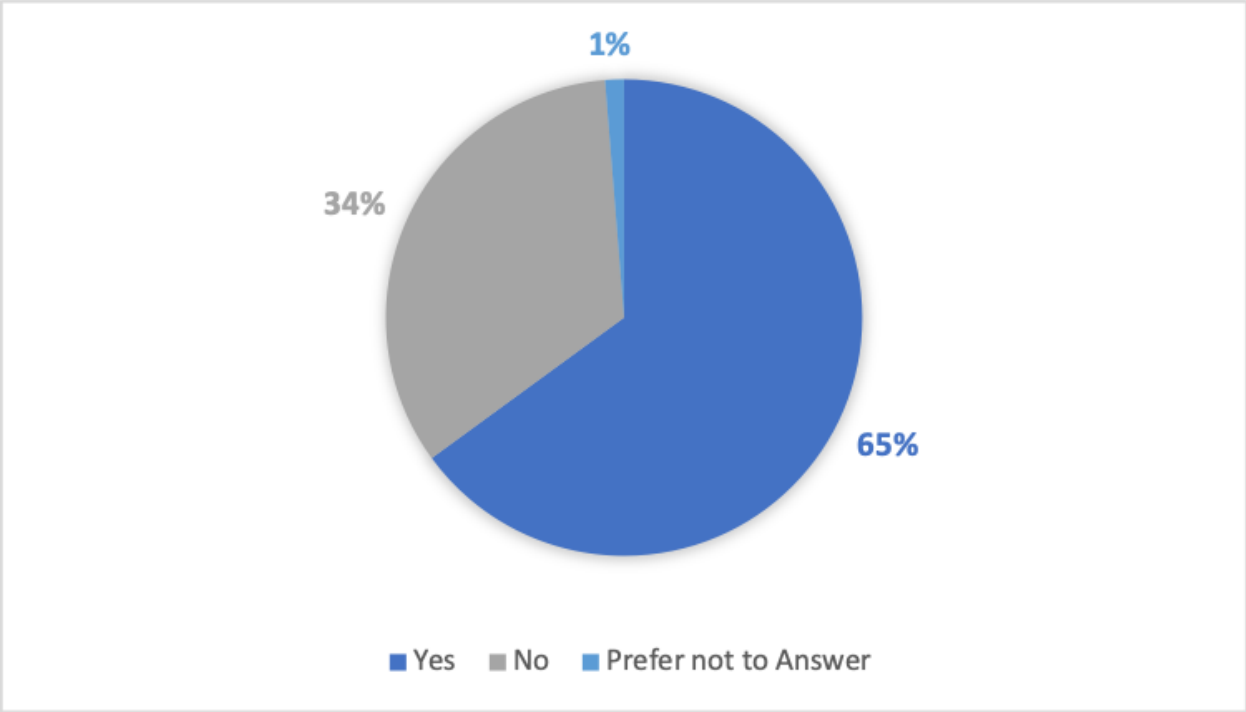


Figure 12: *Did you require other sources of funding during the duration of this award?* Percent of respondents who required other sources of funding while holding their award. 65% responded yes. (n = 391)

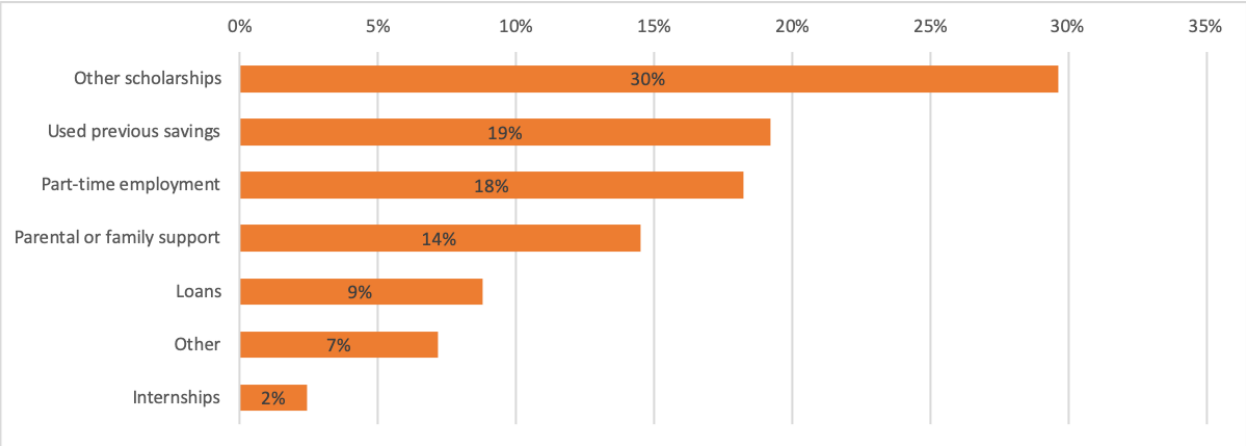


Figure 13: *For those who required other sources of funding during the duration of this award, what type of support did you seek/receive?* Respondents who answered in the affirmative for the above question noted the alternative support they received in addition to their award. 30% relied on other scholarships. (n = 614)

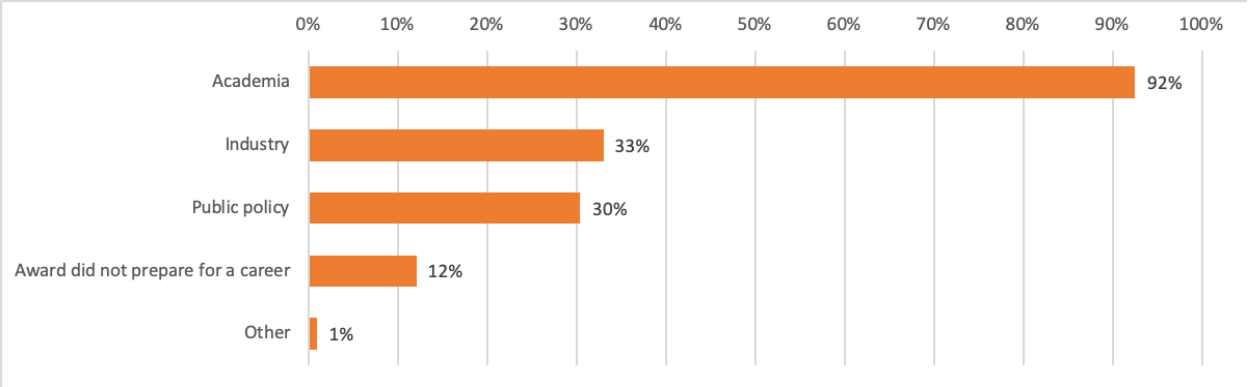


Figure 14: Assistance of federal awards towards diverse career preparation, by percentage of respondents. Trainees were asked to specify which career paths and industries their award helped them prepare for. Multiple answers possible. 92% of respondents indicated that their award prepared them best for a career in academia (n = 306).

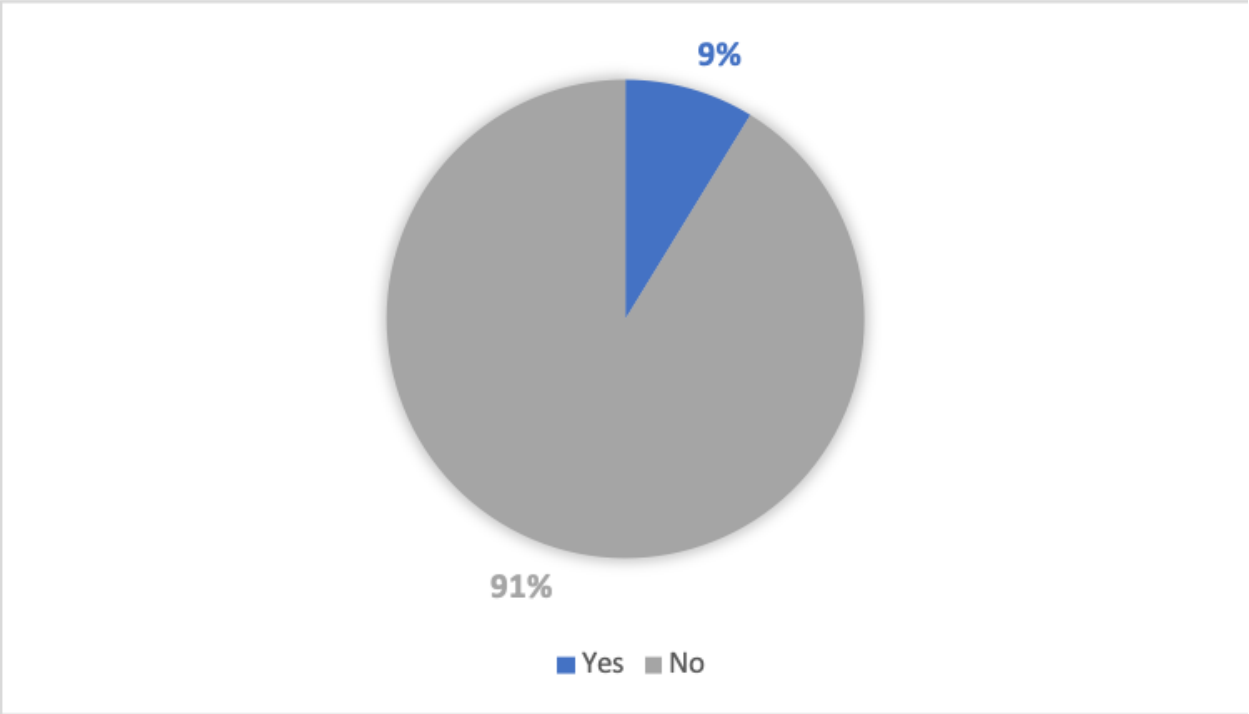


Figure 15: *Did receiving an award have a negative effect on your career or experience?* (n = 388)

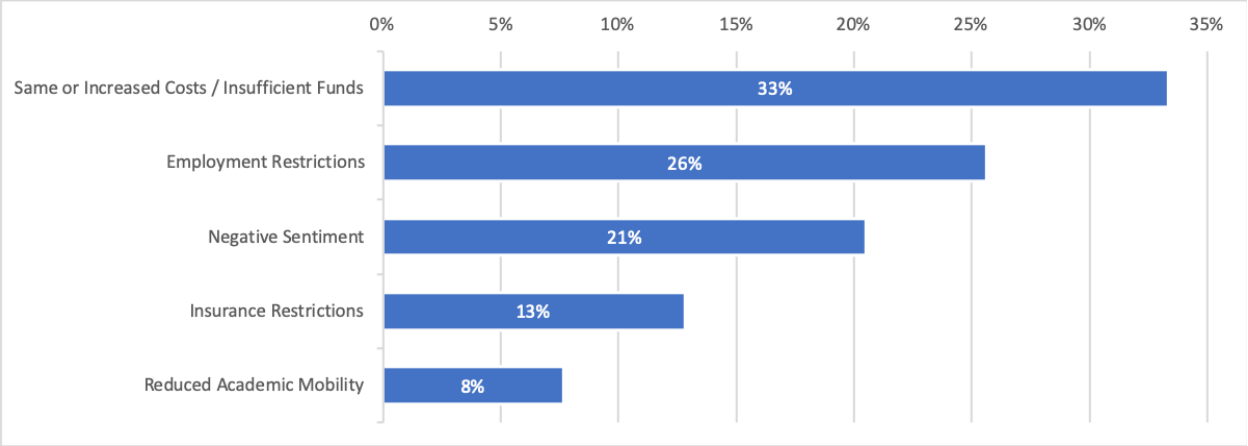


Figure 16: *If receiving an award had a negative effect on your career or experience, please describe here.* Respondents (9%) who had indicated in the above question that the award had a negative effect were asked to describe their experience. Their comments were grouped under five categories, with 33% of respondents indicating insufficient funds as the primary reason for their negative experience (n = 39). Multiple selections were possible.

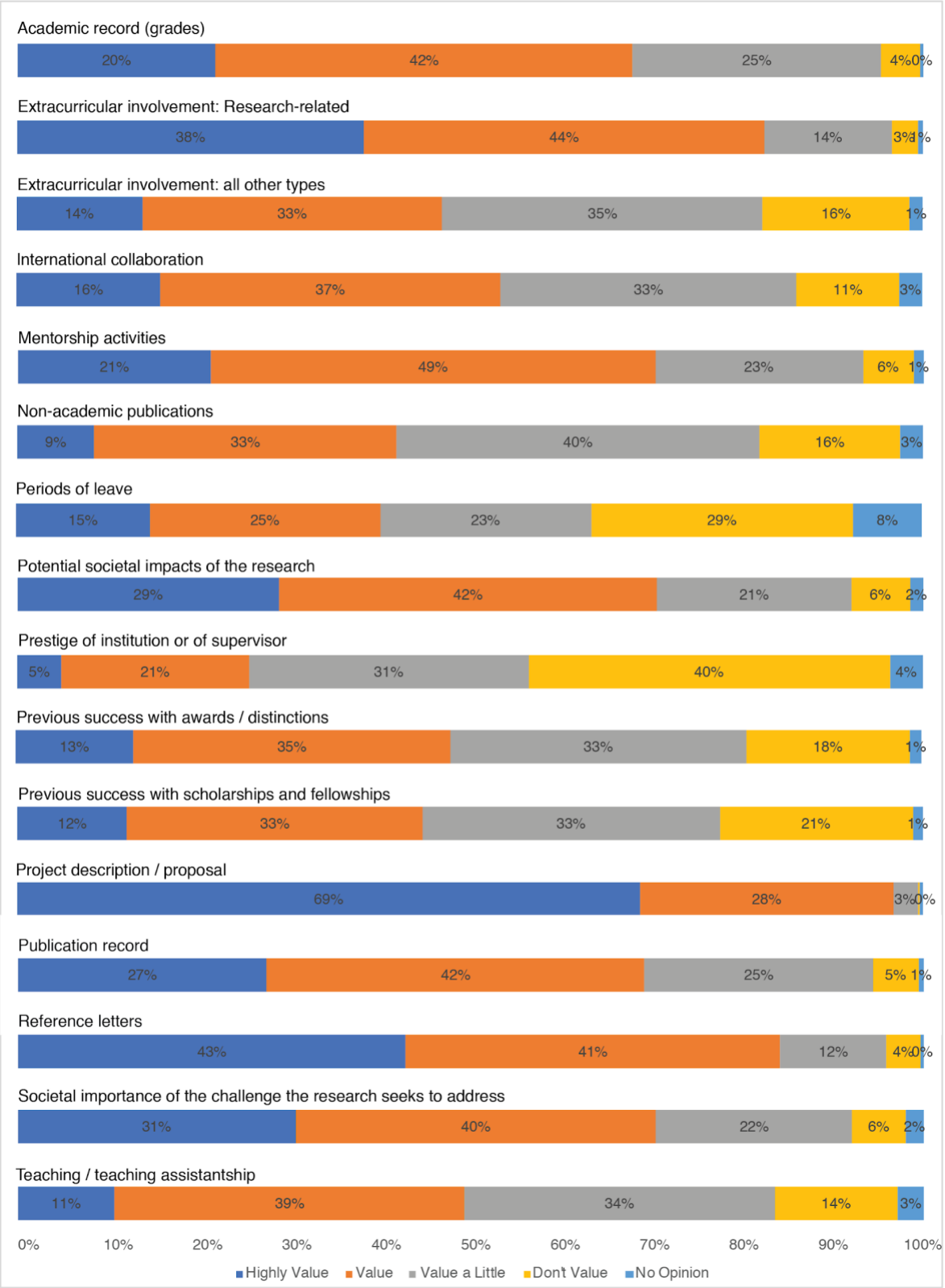


Figure 17: Ideal valuation of award application criteria by reviewers. Respondents were asked to denote how much value should be placed on each possible criteria by reviewers evaluating award applications (n = 1114). Notably, 97% of respondents believe the project description should be either valued or highly valued.

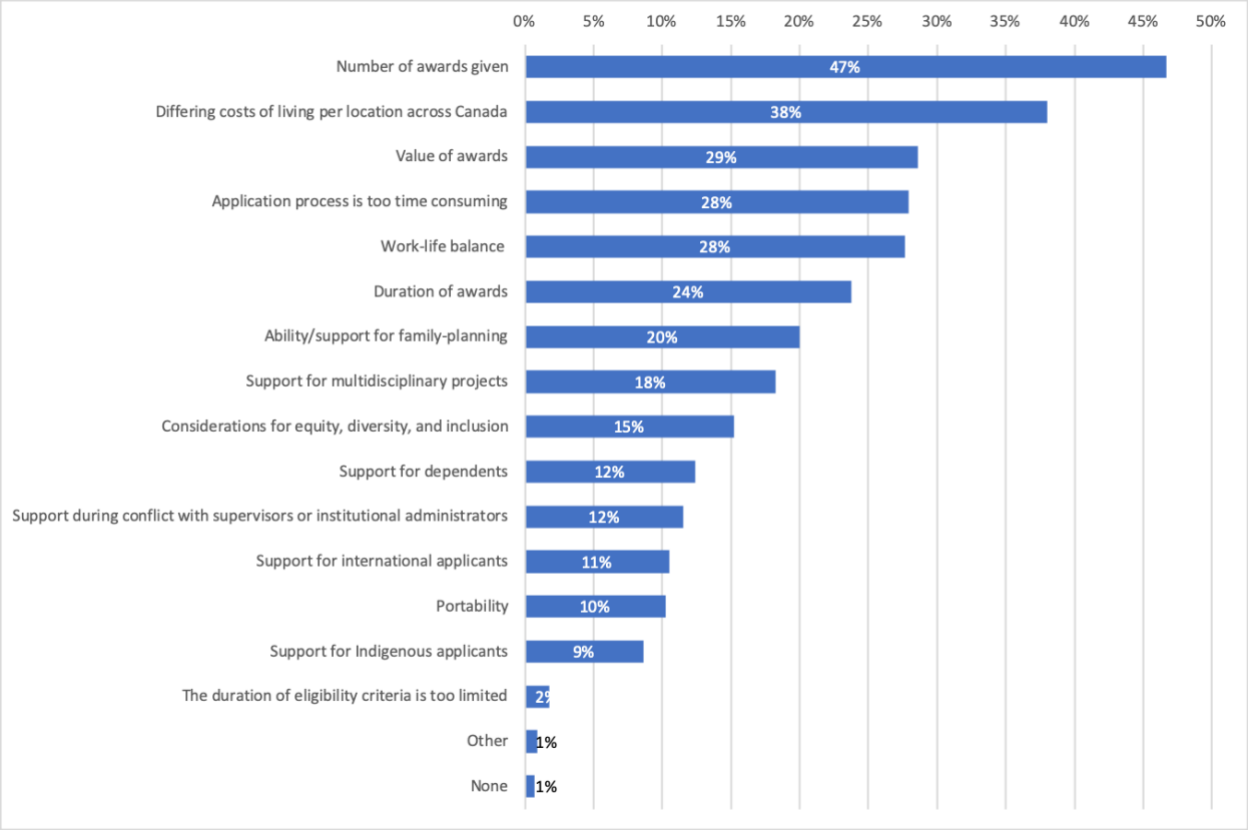


Figure 18: Barriers or problems with current awards opportunities, by percent. Respondents were asked to disclose the barriers affecting either their funding, the application process or the limited availability of federal awards (n = 1111). Multiple selections possible.

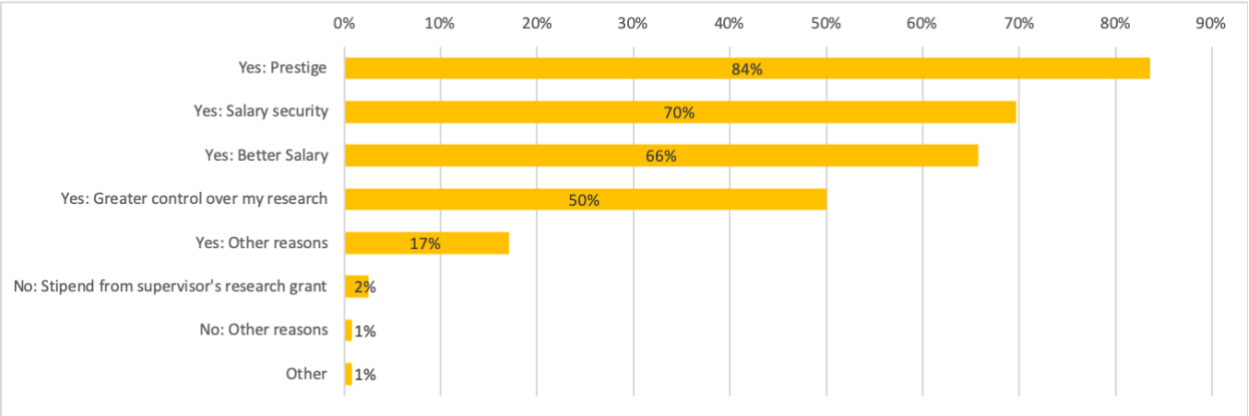


Figure 19: *Do you feel there are benefits of obtaining funding from awards, rather than receiving support from your supervisor's research grants?* Respondents answered this question, stating the benefiting factor, or the reason they believe obtaining funding from awards is non-beneficial (n = 1105). Multiple selections possible. Reported by percent respondents.

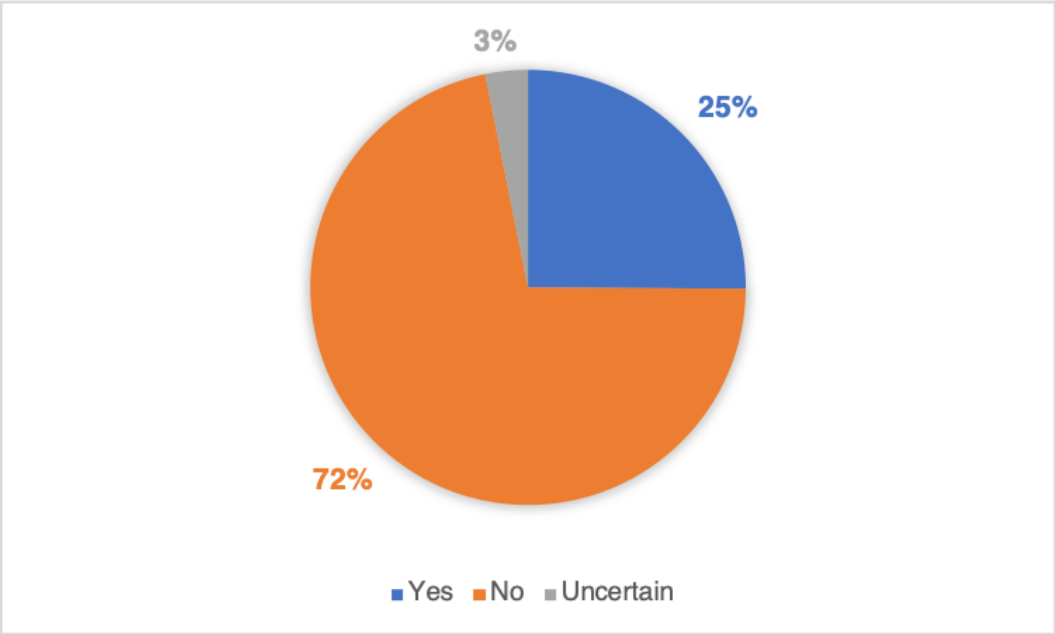


Figure 20: *Do you think your field of research is not adequately represented by the awards opportunities available from CIHR, NSERC, or SSHRC?* By percent (n = 1108).

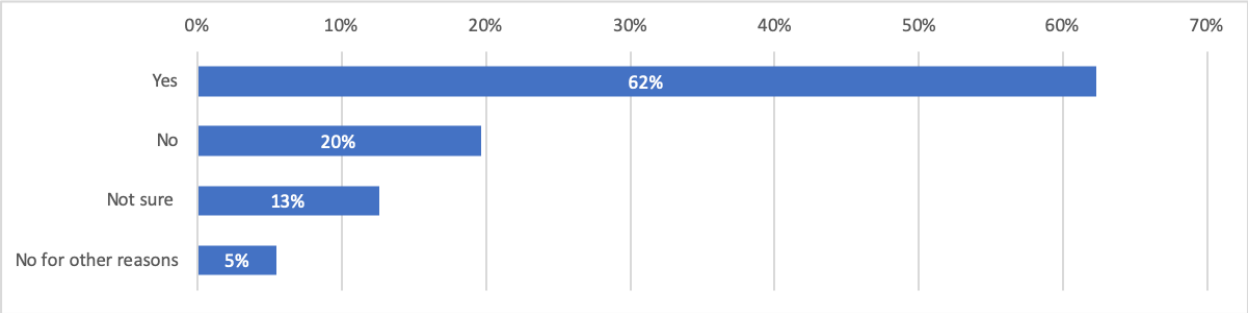


Figure 21: *Do you think that scholarships and fellowships should help to prepare trainees for diverse careers outside of academia?* Reported by percent respondents (n = 1023).

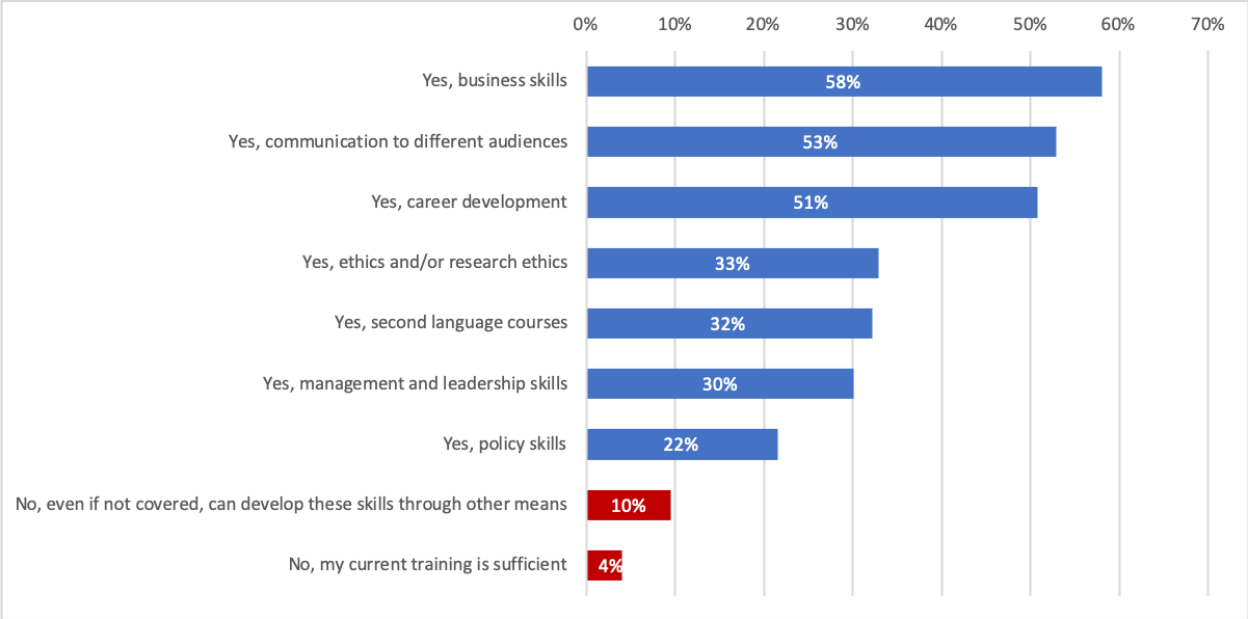


Figure 22: Recommended skills to be incorporated into ideal academic training. Respondents were asked to answer if the believed supplementary skills should be incorporated into their training, and if so, which skills. Reported by percent (n = 1088). Multiple selections possible.

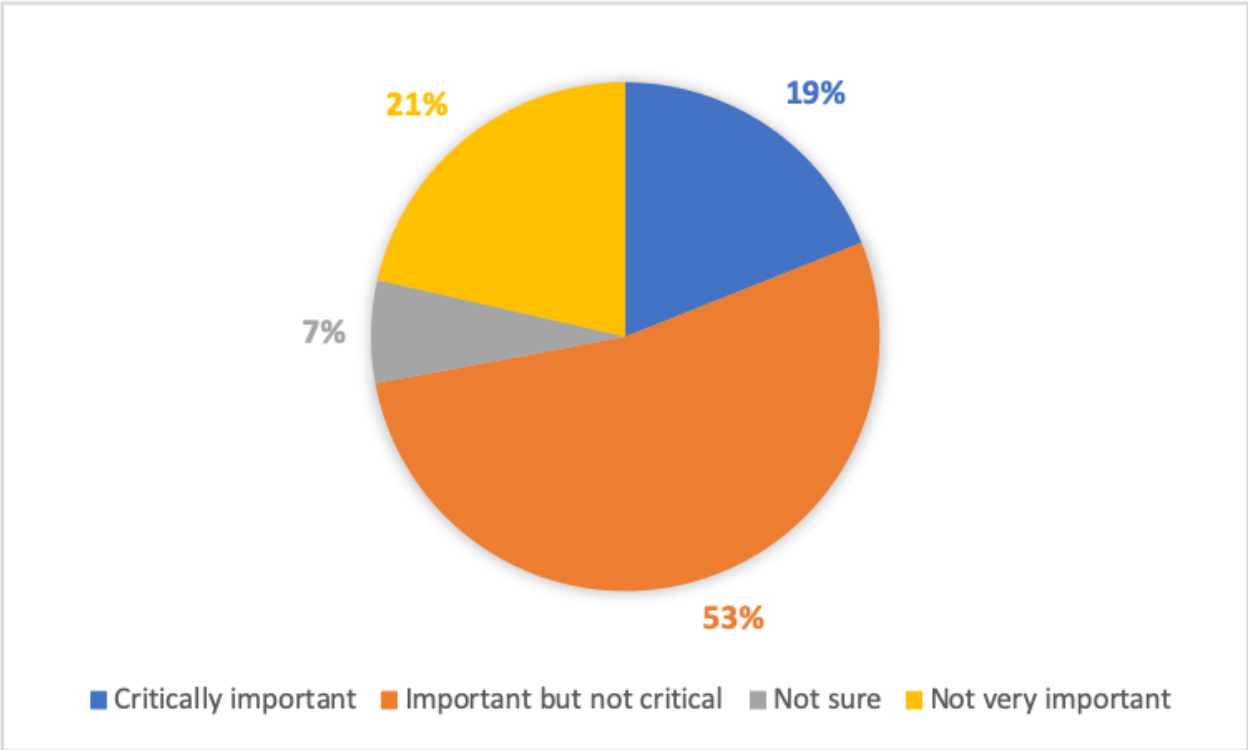


Figure 23: Importance of elite awards. Respondents ranked the importance of the elite Vanier and Banting awards in the federal funding system (n = 1102). Reported by percent.

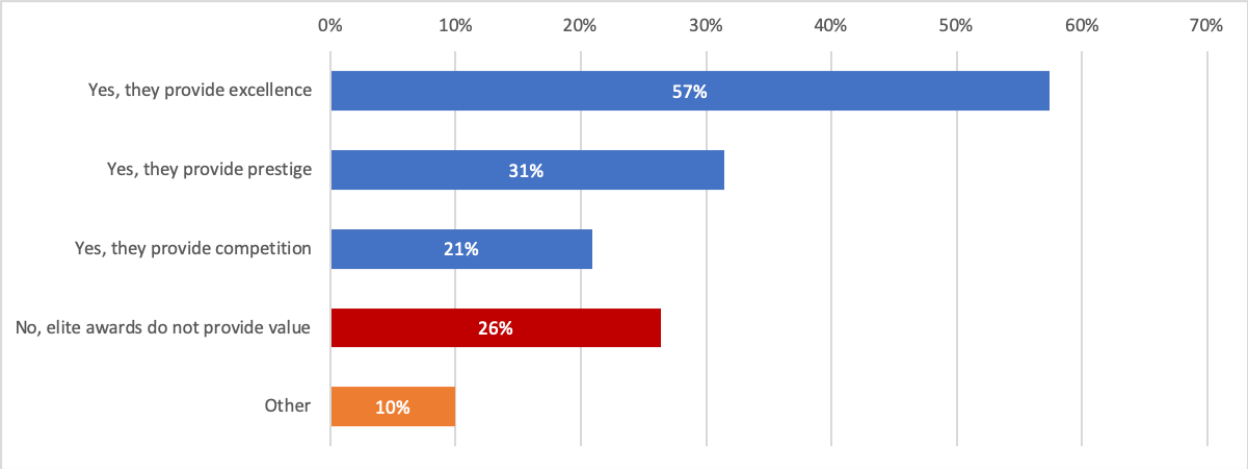


Figure 24: Value and benefits of elite awards in the current funding system. Respondents provided their opinion regarding whether elite awards are valuable, and if so, what benefits they offer (n = 1099). Reported by percent respondents. Multiple selections possible.

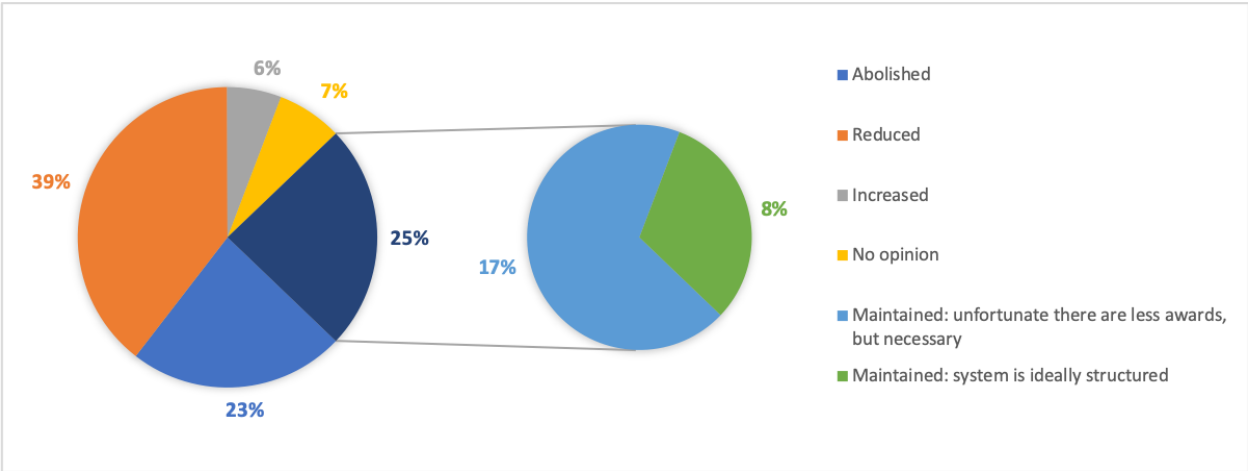


Figure 25: *Elite awards provide greater levels of support and prestige for select trainees, but the investment required reduces the total number of potential awards available.* Considering this statement, respondents stated the ideal future status of elite awards and their inclusion in the federal funding system (n = 1092). Those who wish they be maintained specified their positive or negative sentiment towards their presence in the system. Reported by percent respondents.

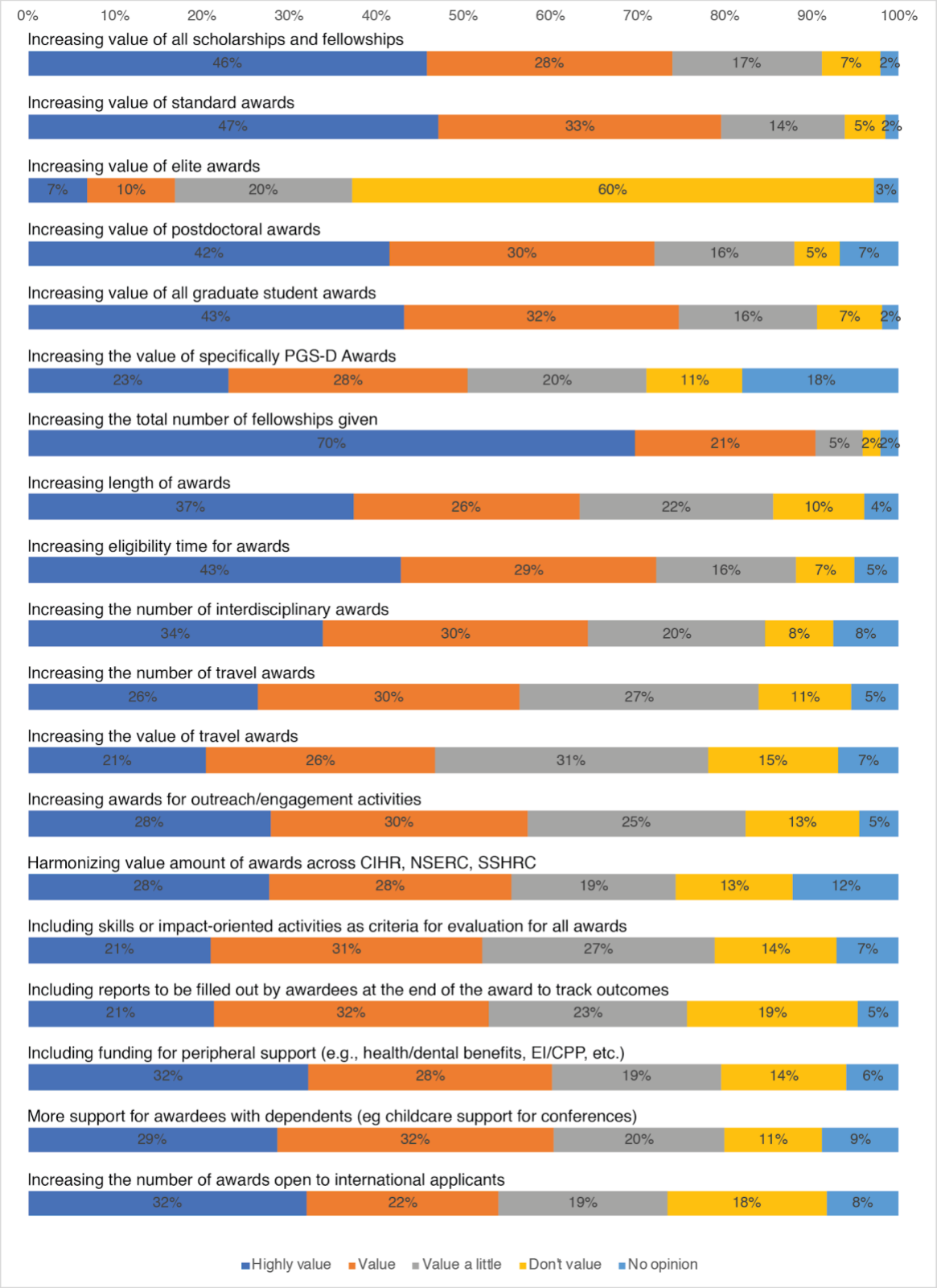


Figure 26: Valuation of increasing award number, value and supplementary support. Respondents were asked to value the above factors, given an increase in the federal budget (n = 1111). The majority of trainees highly valued increasing the number of awards given. Reported by percent.

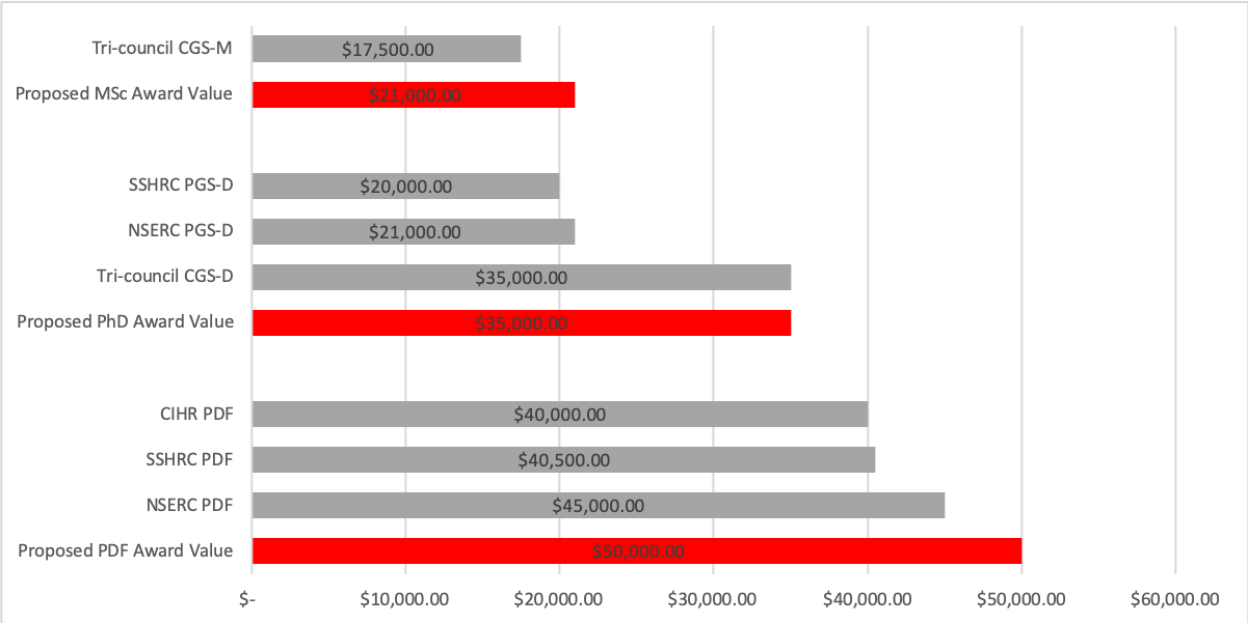


Figure 27: Recommended value of federal awards by level of study. Respondents were asked to generate ideal award values given inflation and the present costs of living in university towns, given there was an increase in the federal budget (n = 1114). Median values are reported in red. Present value of awards offered by the tri-council agencies are denoted in grey.

Conclusions

A close to unanimous 98% of participants identify clear benefits to obtaining support through awards rather than from their supervisors' research grants. 9 in 10 respondents favour increasing the number of awards, and 8 in 10 supported increasing their value. While Budget 2019 included some increased funding for graduate fellowships and scholarships, the value was insufficient for the system's needs[2] and it failed to include postdoctoral researchers as beneficiaries. Moreover, of the students and postdoctoral fellows who are able to obtain federal funding, 66% still require additional funds to cover their expenses over the course of their program. In part, these challenges stem from a lack of clarity regarding the purpose of the federal funding. Fellowships, for example, are generally seen as a full ride by the universities, while the granting councils see this as assistance in addition to the support provided by the institution. Minimum standards set or endorsed by the granting councils would help in addressing this discrepancy.

Regarding the value of awards, it is first of all important to note that nearly two thirds of graduate students and postdoctoral fellows reported here believe that Vanier and Banting elite awards should be reduced or abolished. Indeed, as previously noted, any government awards, including standard awards, have a positive impact on the career of the grand majority of our respondents; elite awards are not seen as necessary in our funding system, and reducing or abolishing them could offer additional opportunities for standard federal awards, either in number or value. Respondents reasonably recommended increased value of the awards for each level of study: with $21,000 for

[2] Advisory Panel on Federal Support for Fundamental Science: "Fundamental Science Review. Investing in Canada's Future - Strengthening the Foundations of Canadian Research." https://www.sciencereview.ca/eic/site/059.nsf/vwapj/ScienceReview_April2017-rv.pdf/$file/ScienceReview_April2017-rv.pdf

Masters level (versus current $17-21,000), $35,000 for Doctoral (versus current $20-35,000), and $50,000 for Postdoctoral Fellowships (versus current $40-45,000). These increases follow inflation and would be more adapted to the standard of living of many large cities in which universities are located. Interestingly, the recommended value of students for the doctoral federal awards is on par with that of the tri-council CGS-D, indicating for this award in particular - the funding agencies are beginning to approach the needs of students with a select few of their award valuations.

Finally, respondents emphasize the need to update the application review process. 85% believe reviewers should give high importance to the description of the research project proposed. However, over 8 in 10 ECRs also believe that extracurricular activities related to research should be considered by reviewers as well, and place value on the consideration of awards attained for scientific outreach and engagement activities in granting criteria. This speaks to a wide recognition by early career researchers that many trainees will transition to working outside of academia[3]. Shifting the review criteria of award applications will ensure the federal government rewards the many forms of research excellence exhibited by its young scientists, destined for varied sectors, to build a more innovative, prosperous, and inclusive Canada.

[3] University of Toronto School of Graduate Studies: “The 10,000 PhDs Project, University of Toronto.” https://www.sgs.utoronto.ca/wp-content/uploads/sites/253/2019/06/SGS_Overview_10KPhDsProject.pdf

Chapter III: Analysis by Field of Study

Introduction

To evaluate the distribution and success of grant applications, and barriers to obtaining external funding opportunities across disciplines, an analysis was performed based on the respondents' self-reported fields of study. For the purpose of this analysis, self-reported disciplines were classified into 5 categories: 1) Health, 2) Humanities, 3) Life Sciences, 4) Physical Sciences, Mathematics & Engineering, and 5) Social Sciences.

Multidisciplinary programs which span two or more of these aforementioned, more traditional, siloes were grouped into a sixth classification, Interdisciplinary Studies. We acknowledge the relatively low sample size of trainees undertaking interdisciplinary studies (7 respondents), however, SPE believes that the experiences of this group present specific barriers and funding gaps that must be recognized. Additionally, this group well represents those conducting intersectional research that is becoming more critical in a rapidly evolving world and knowledge-based economy, and thus their perspectives should be considered. Overall, Tri-Council Agency funding programs largely corresponded to the aforementioned disciplines: CIHR with Health; NSERC with Life Sciences, and Physical Sciences; SSHRC with Social Sciences and Humanities.

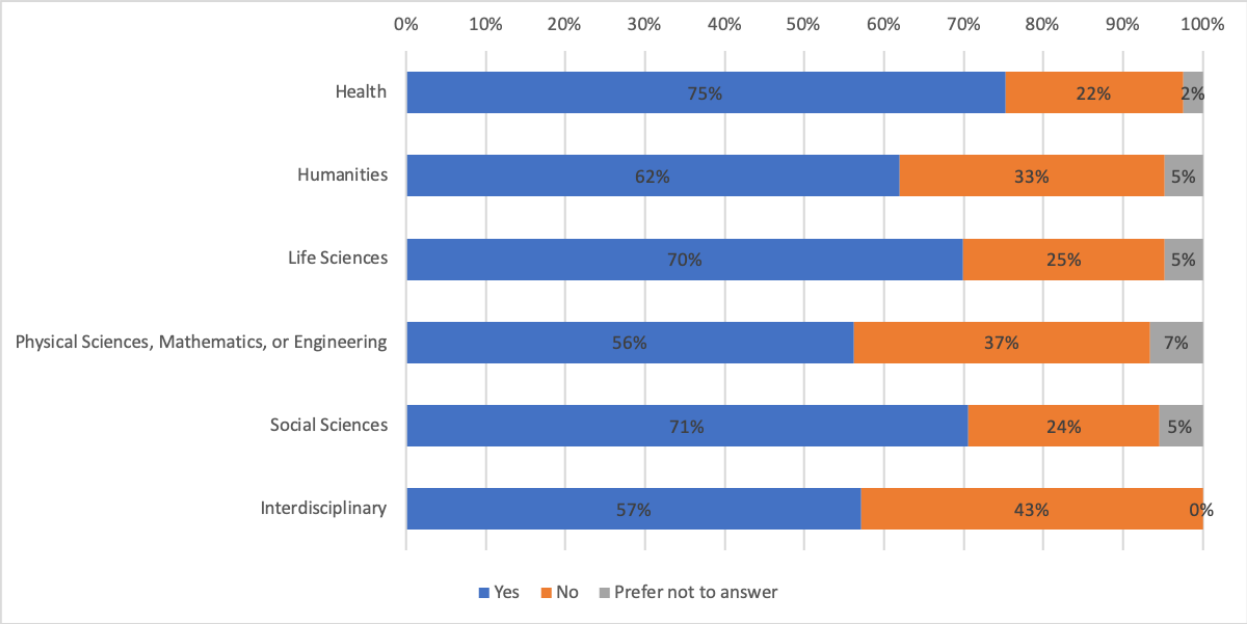


Figure 28: *Have you ever applied for a graduate or postdoctoral fellowship through CIHR, NSERC, or SSHRC?* (n =247, n =42, n = 466, n = 242, n = 112, n = 7).

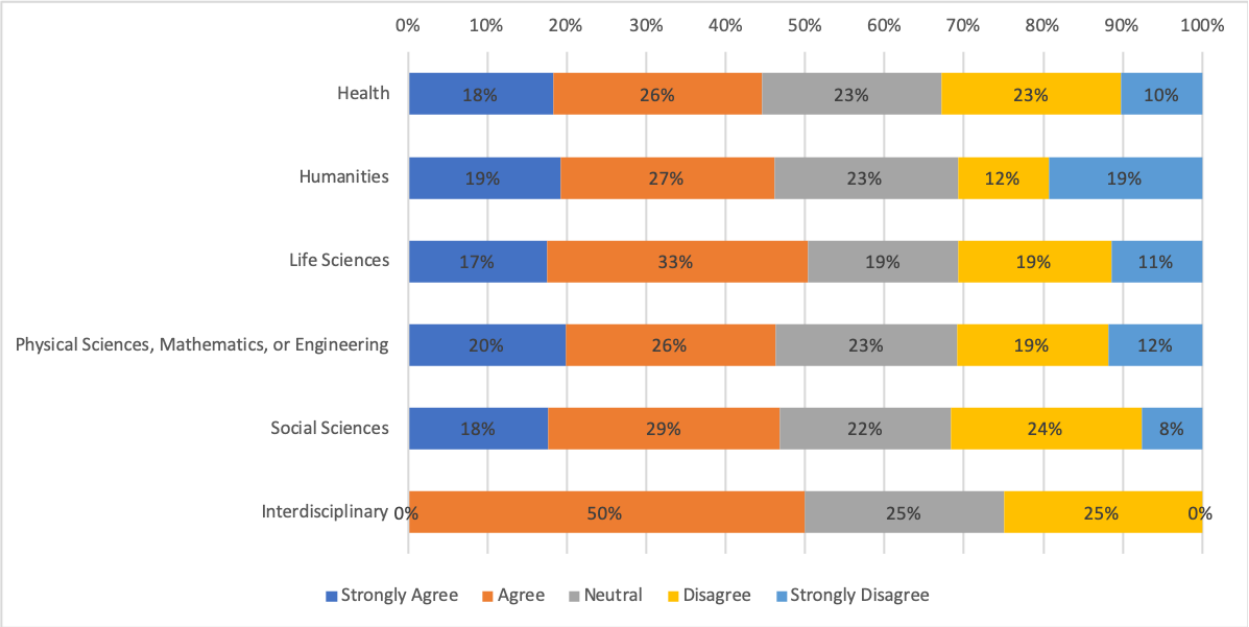


Figure 29: *I received adequate resources to help me complete my application*. Respondents were asked to state to what degree they agree with the previous statement by ranking agreeance from 1 - 5: 1 corresponds to strongly agree, 5 to strongly disagree (n = 186, n = 26, n = 326, n = 136, n = 79, n = 4). Data shown by percent respondents.

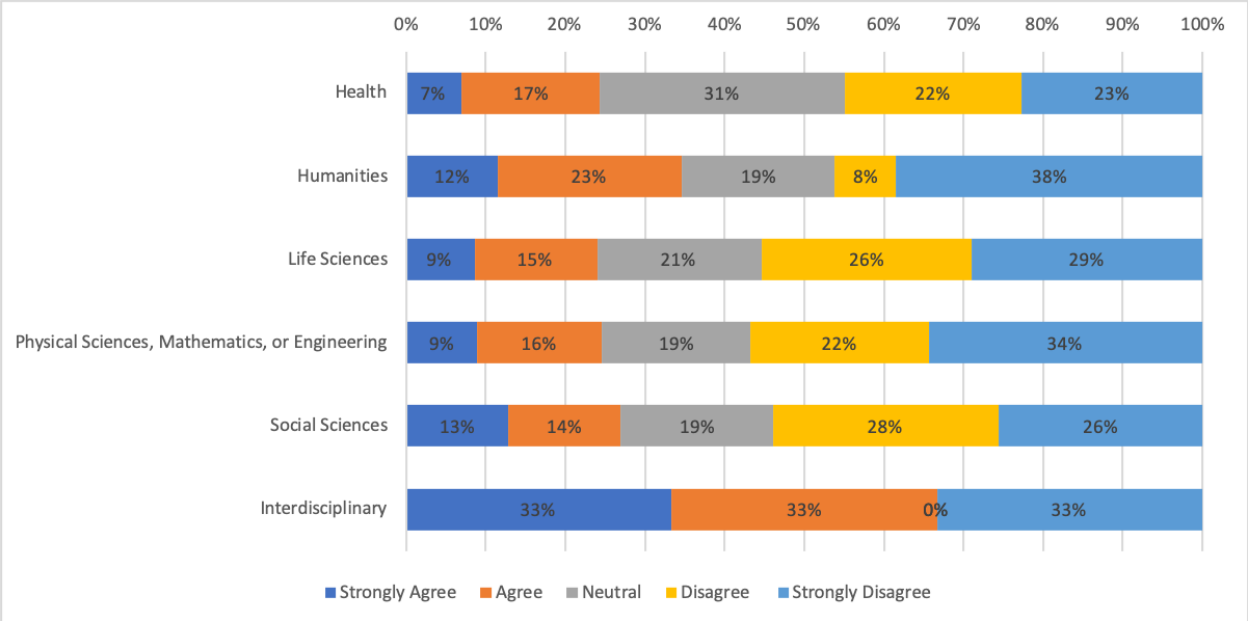


Figure 30: *I received useful feedback from my application, whether or not it was successful*. Respondents were asked to state to what degree they agree with the previous statement by ranking agreeance from 1 - 5: 1 corresponds to strongly agree, 5 to strongly disagree (n = 185, n = 26, n = 325, n = 134, n = 78, n = 3). Data shown by percent respondents.

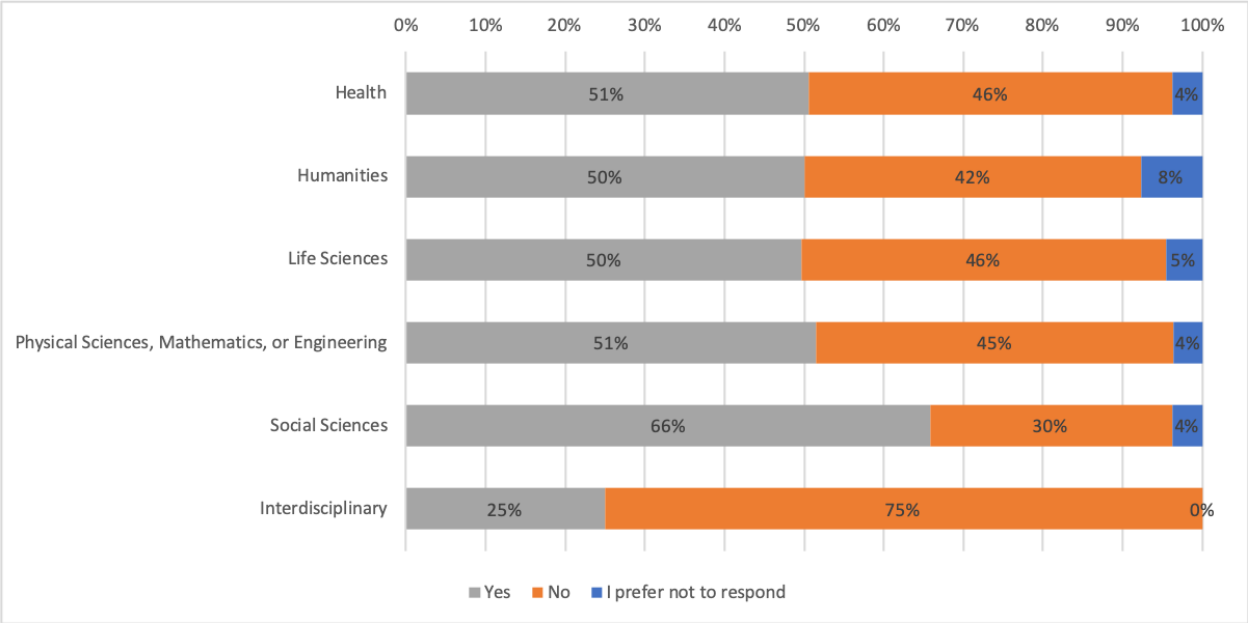


Figure 31: *Were any of your application(s) successful?* Percent of attendees with successful award applications (n = 186, n = 26, n = 326, n = 136, n = 79, n = 4). 391 respondents had successful federal fellowship or scholarship applications.

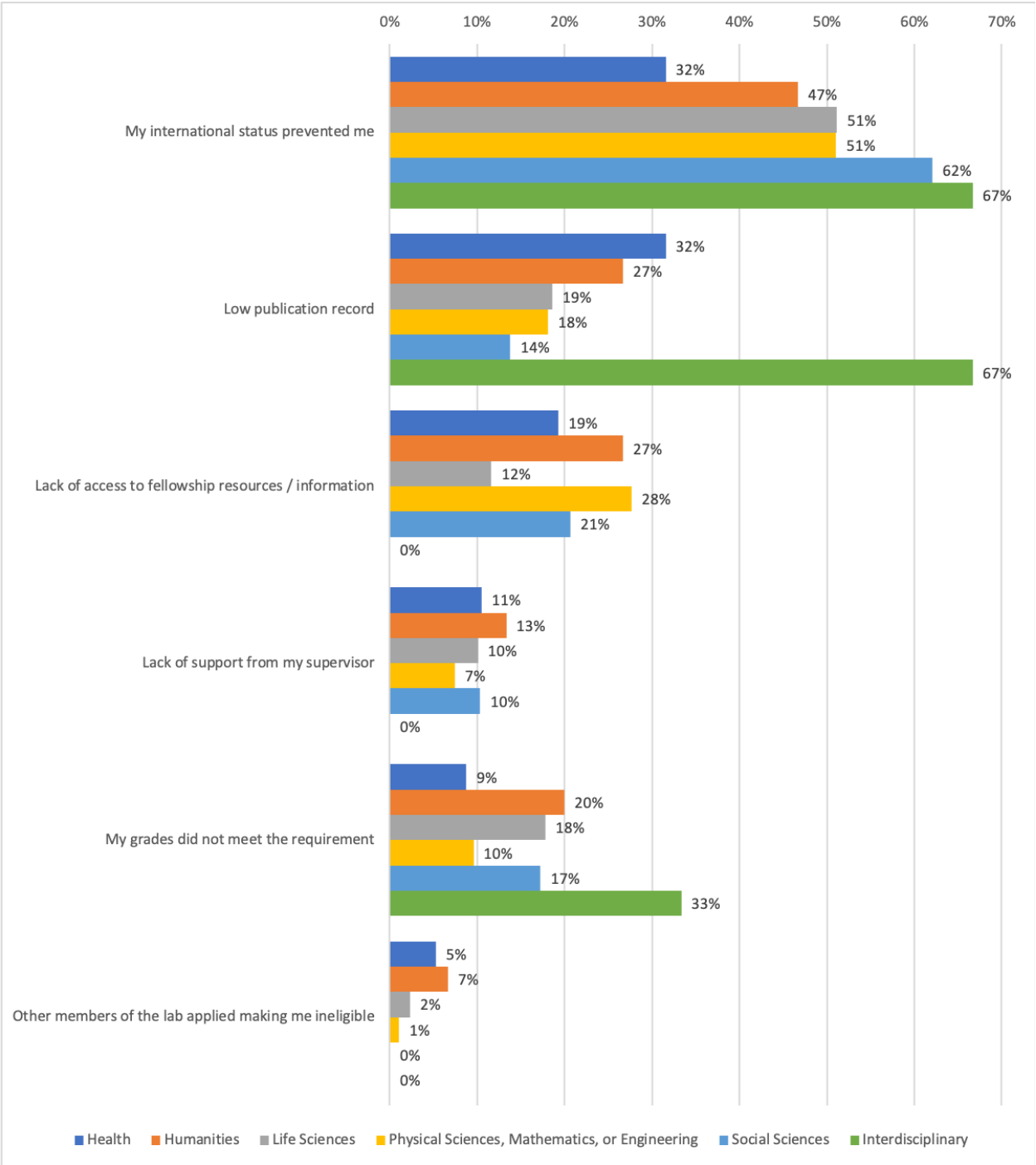


Figure 32: *What prevented you from applying?* Respondents were asked to indicate the reason that prevented them from applying for fellowships/scholarships. (n = 57, n = 15, n = 129, n = 94, n = 29, n = 3).

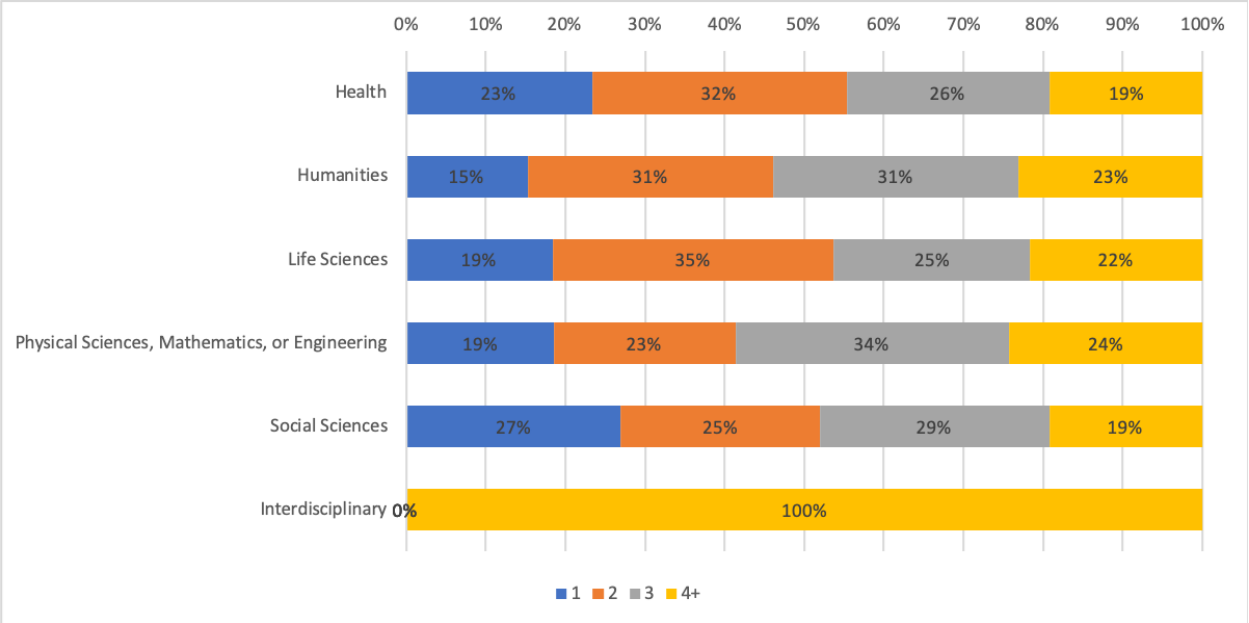


Figure 33: *How many federal fellowships/studentships have you applied for?* Successful awardees disclosed the number of federal grants to which they applied. (n = 94, n = 13, n = 162, n = 70, n = 52, n = 1).

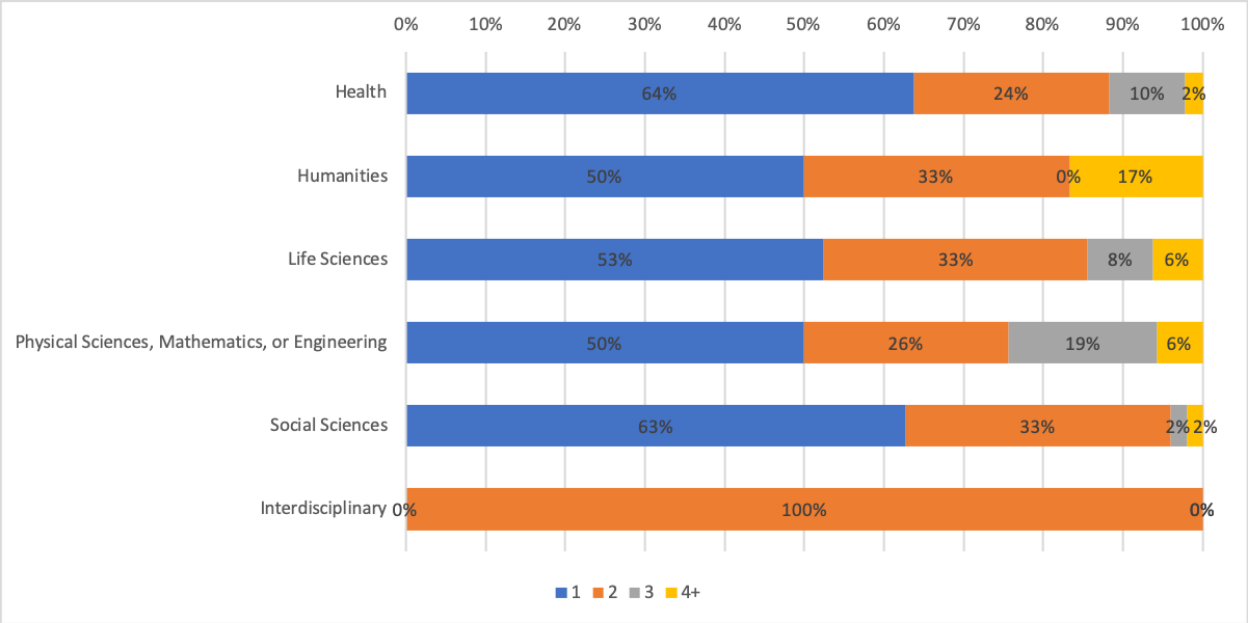


Figure 34: *How many of your federal fellowship/studentship applications have been successful?* Successful awardees disclosed the number of federal grants they received. (n = 94, n = 12, n = 160, n = 70, n = 51, n = 1).

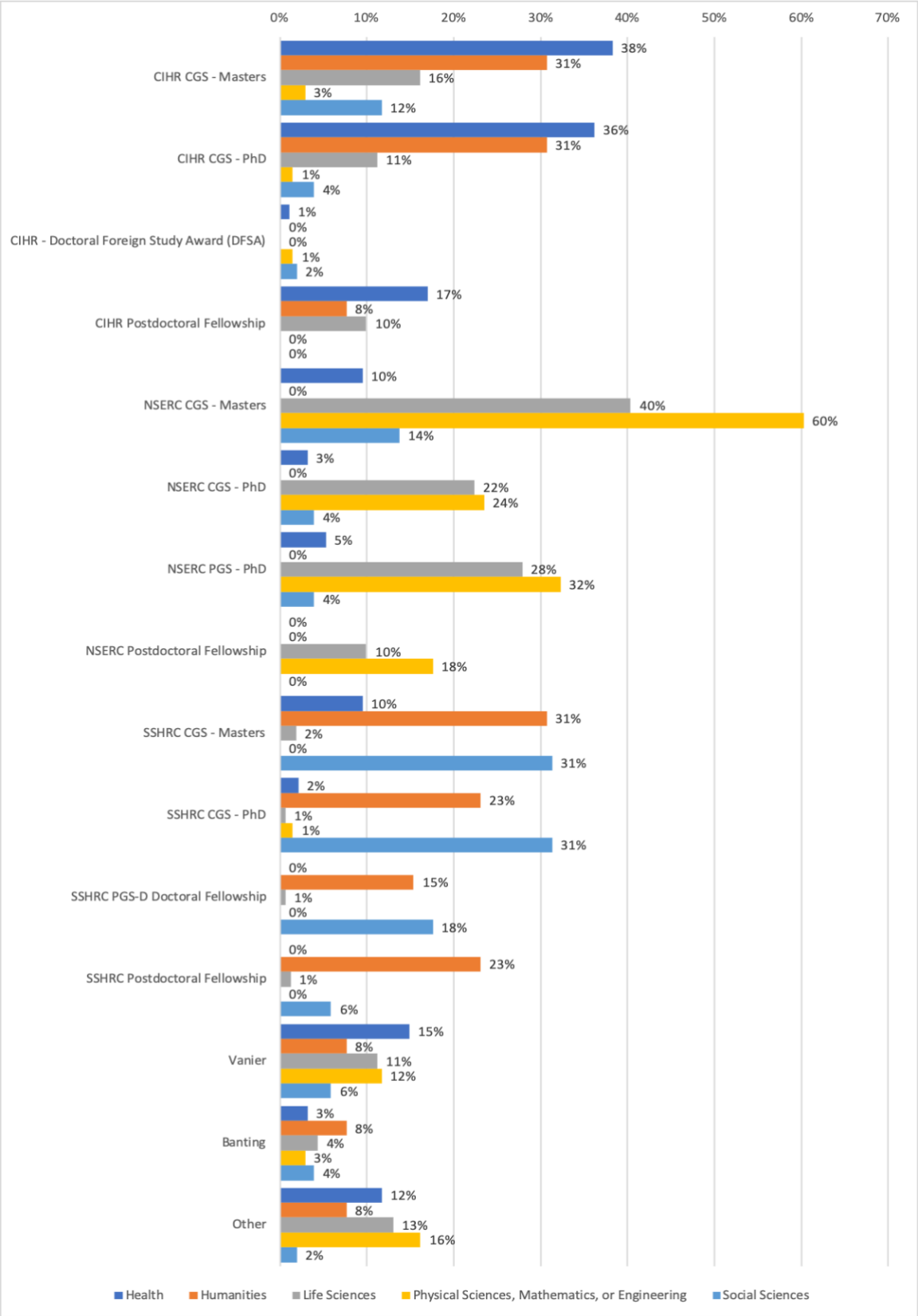


Figure 35: *Federal awards received.* Respondents noted which awards they successfully received, with more than one award per applicant possible (n = 94, n = 13, n = 161, n = 68, n = 51).

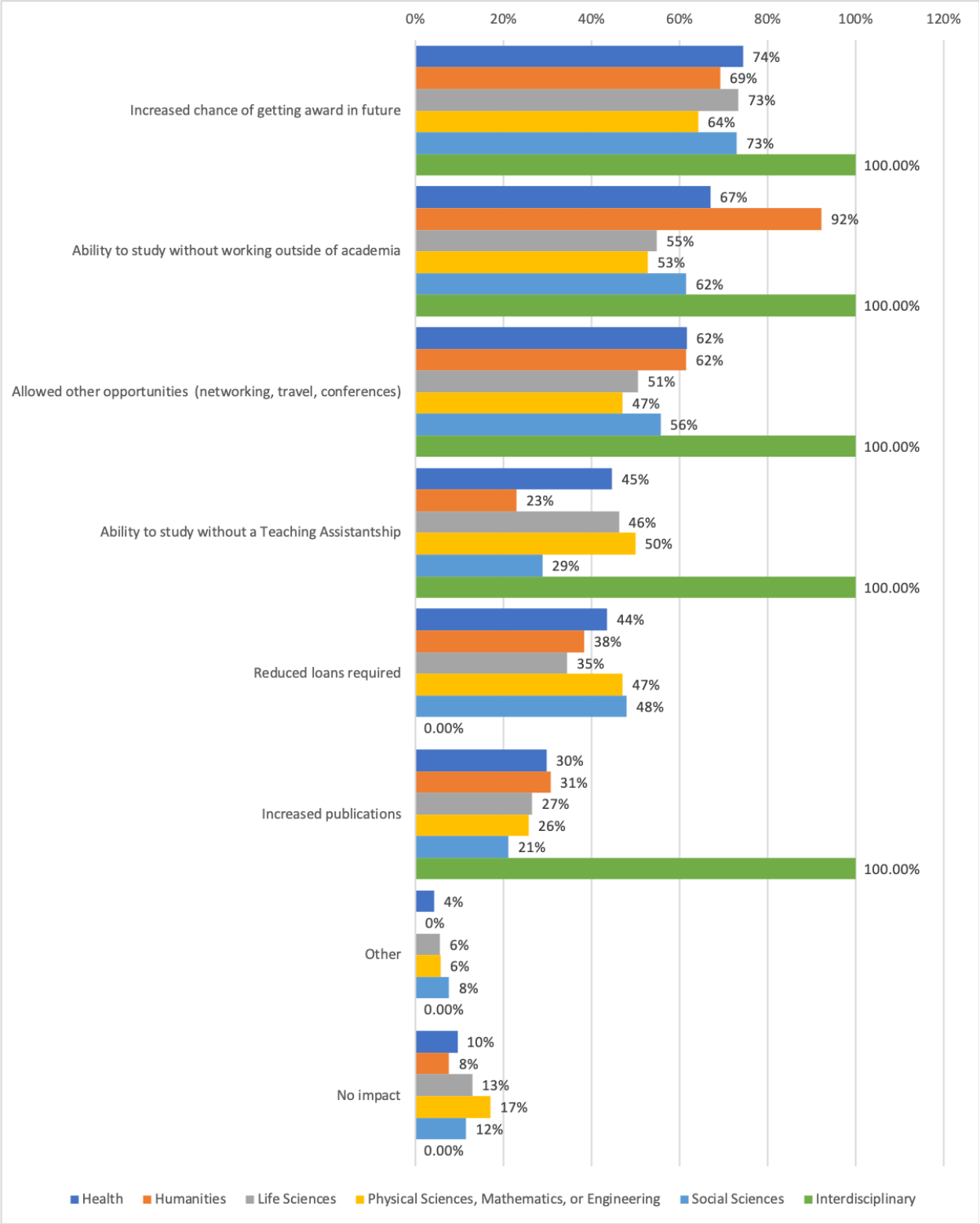


Figure 36: *What impact did receiving an award have on you and your research?* Benefits of receiving an award on successful awardees, by percent (n = 94, n = 13, n = 162, n = 70, n = 52, n = 1).

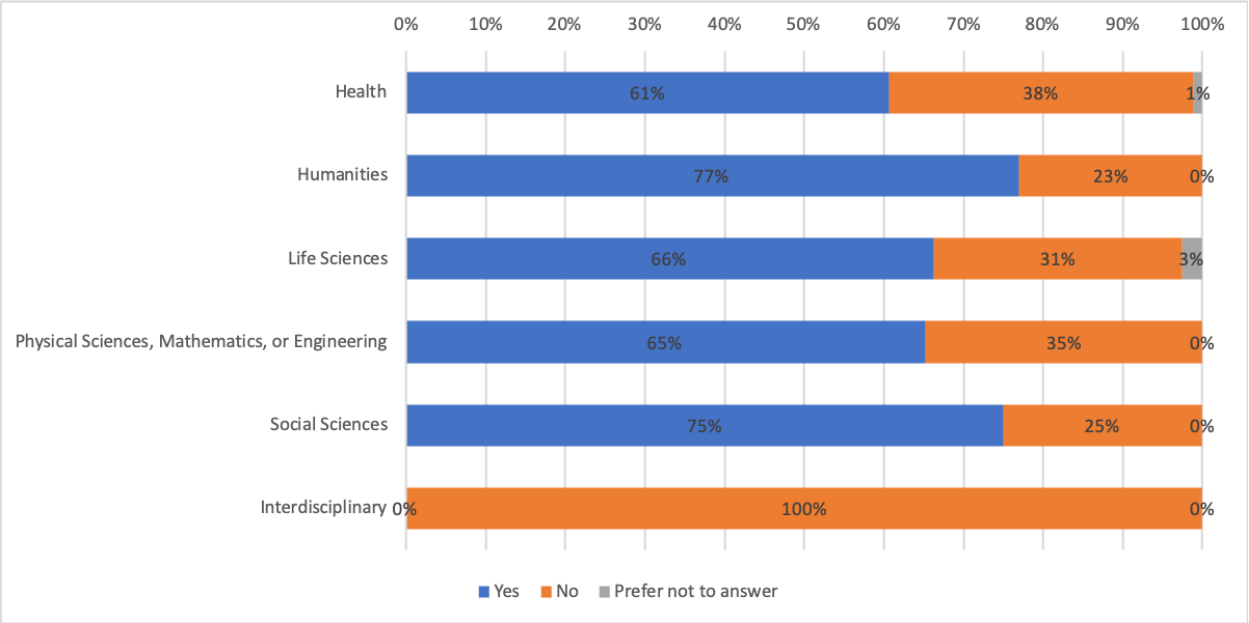


Figure 37: *Did you require other sources of funding during the duration of this award?* Percent of respondents who required other sources of funding while holding their award (n = 94, n = 13, n = 154, n = 69, n = 52, n = 1).

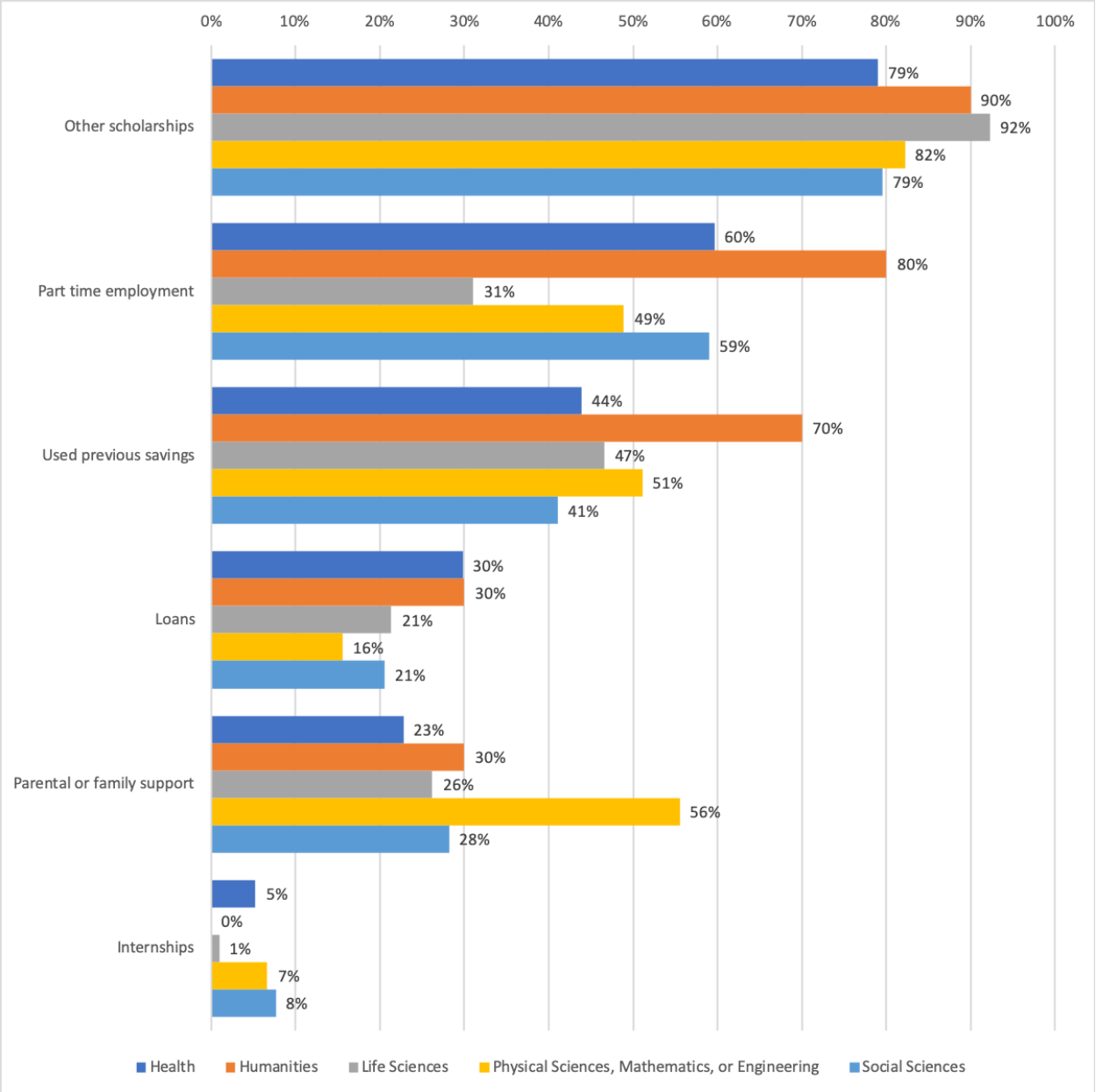


Figure 38: *For those who required other sources of funding during the duration of this award, what type of support did you seek/receive?* Respondents who answered in the affirmative for the above question noted the alternative support they received in addition to their award (n = 57, n = 10, n = 103, n = 45, n = 39).

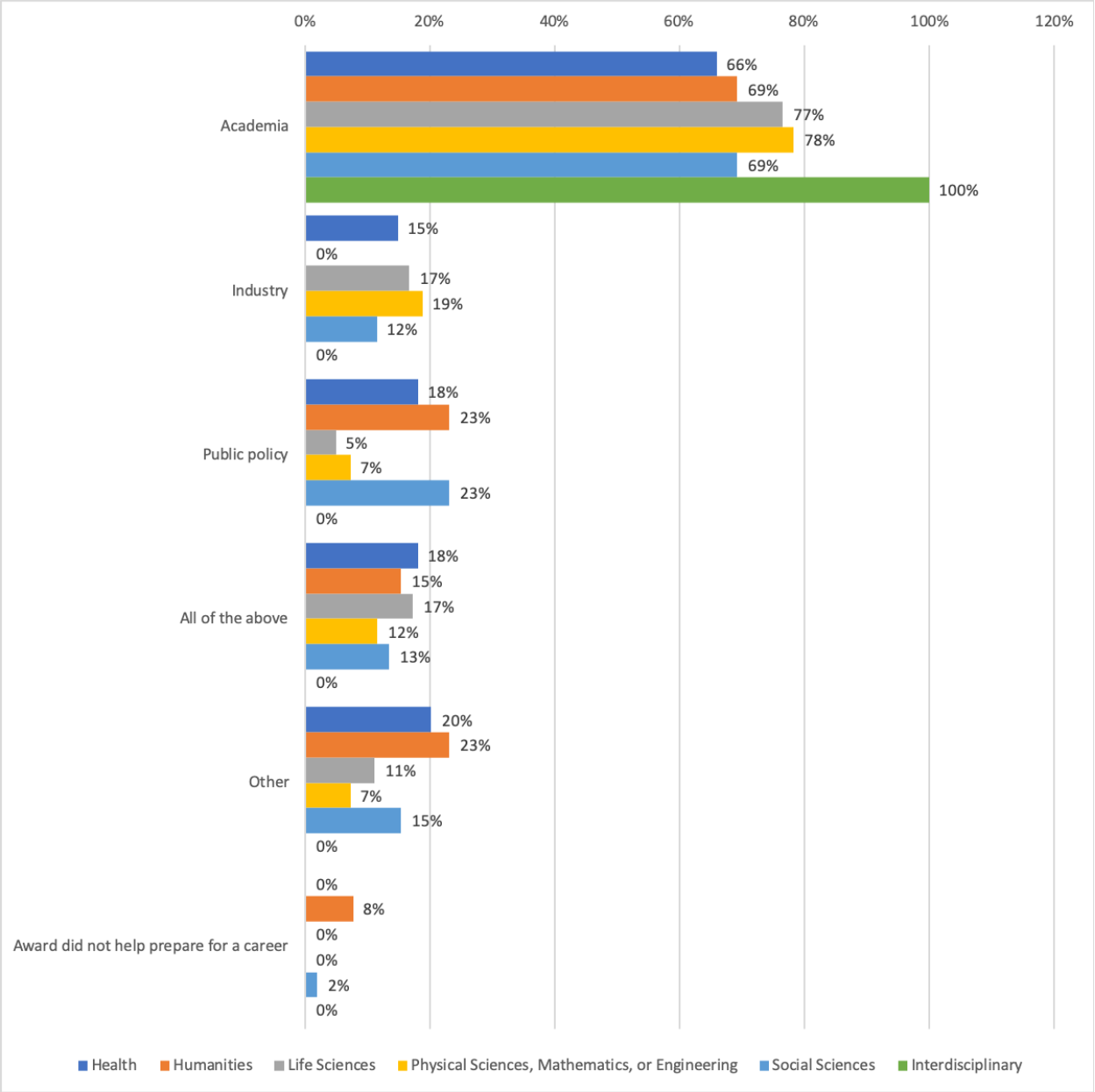


Figure 39: Assistance of federal awards towards diverse career preparation, by number of respondents. Trainees were asked to specify which career paths and industries their award helped them prepare for. Multiple answers possible. 337 respondents indicated that their award prepared them best for a career in academia (n = 94, n = 13, n = 162, n = 69, n = 52, n = 1).

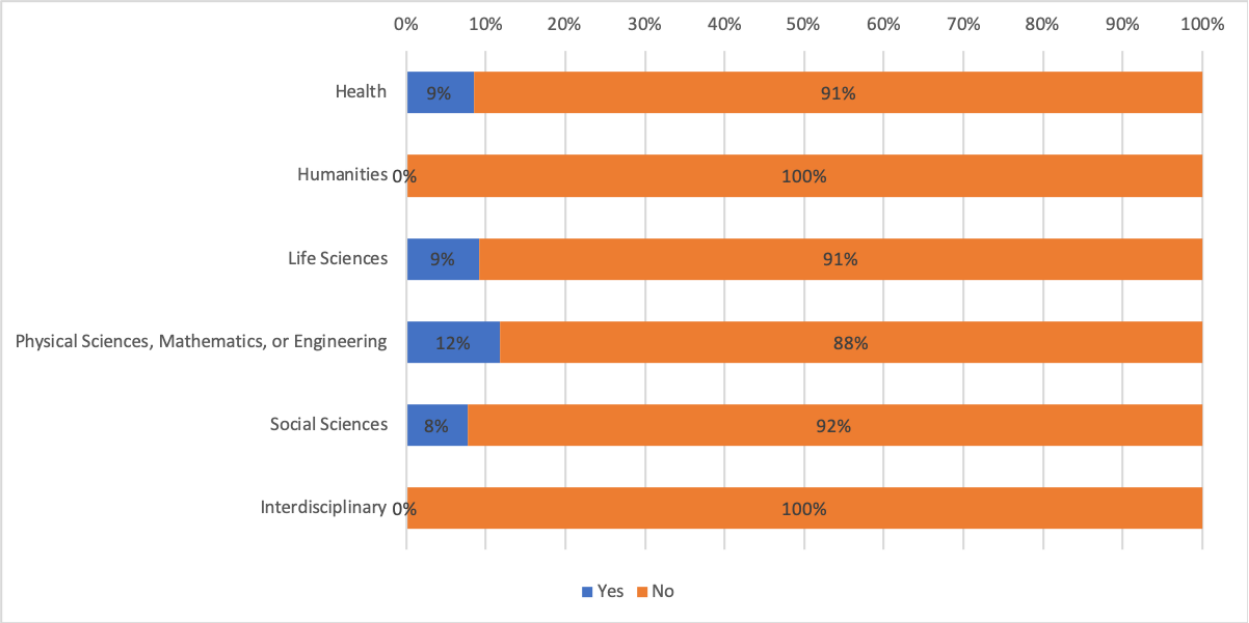


Figure 40: *Did receiving an award have a negative effect on your career or experience?* (n = 93, n = 13, n = 163, n = 68, n = 52, n = 1).

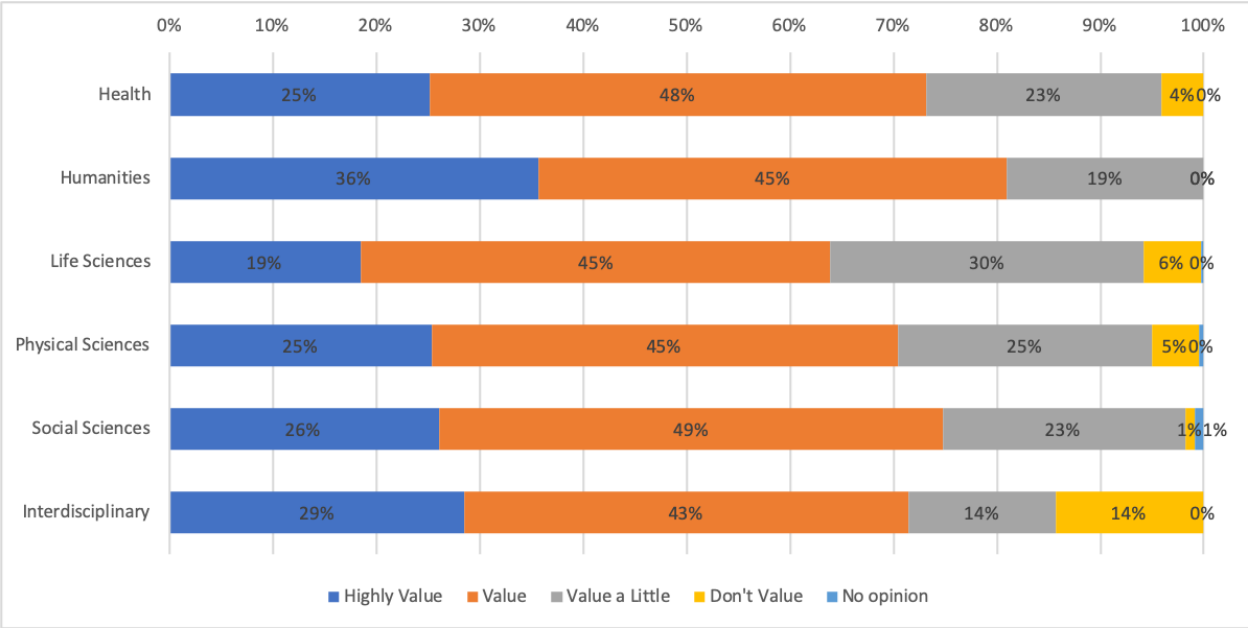


Figure 41: Ideal valuation of fellowship application criteria by reviewers: Academic record. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 242, n = 42, n = 463, n = 240, n = 111, n = 7).

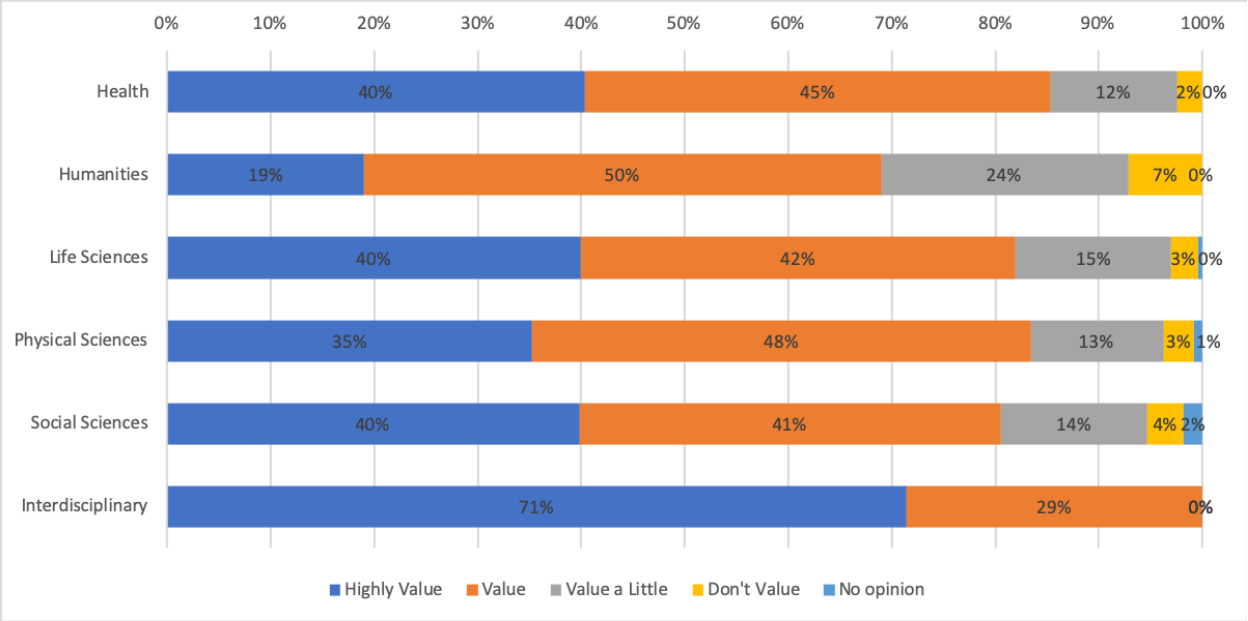


Figure 42: Ideal valuation of fellowship application criteria by reviewers: Research-related extracurricular involvement. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 245, n = 42, n = 466, n = 241, n = 113, n = 7).

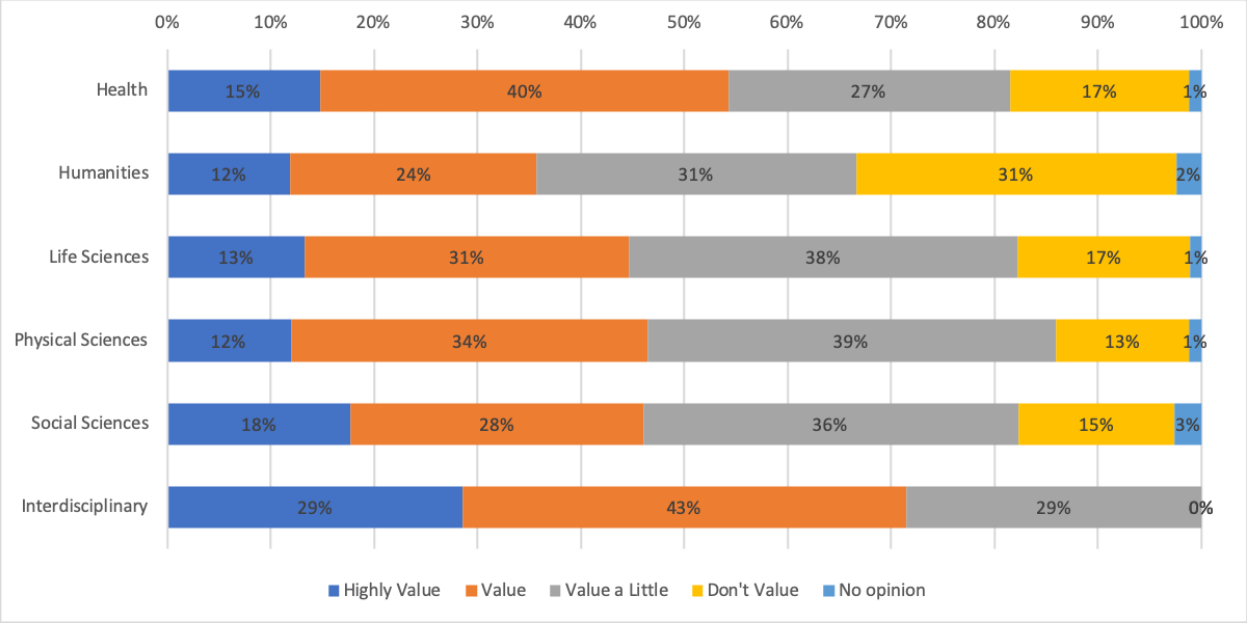


Figure 43: Ideal valuation of fellowship application criteria by reviewers: All other types of extracurricular involvement. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 243, n = 42, n = 466, n = 241, n = 113, n = 7).

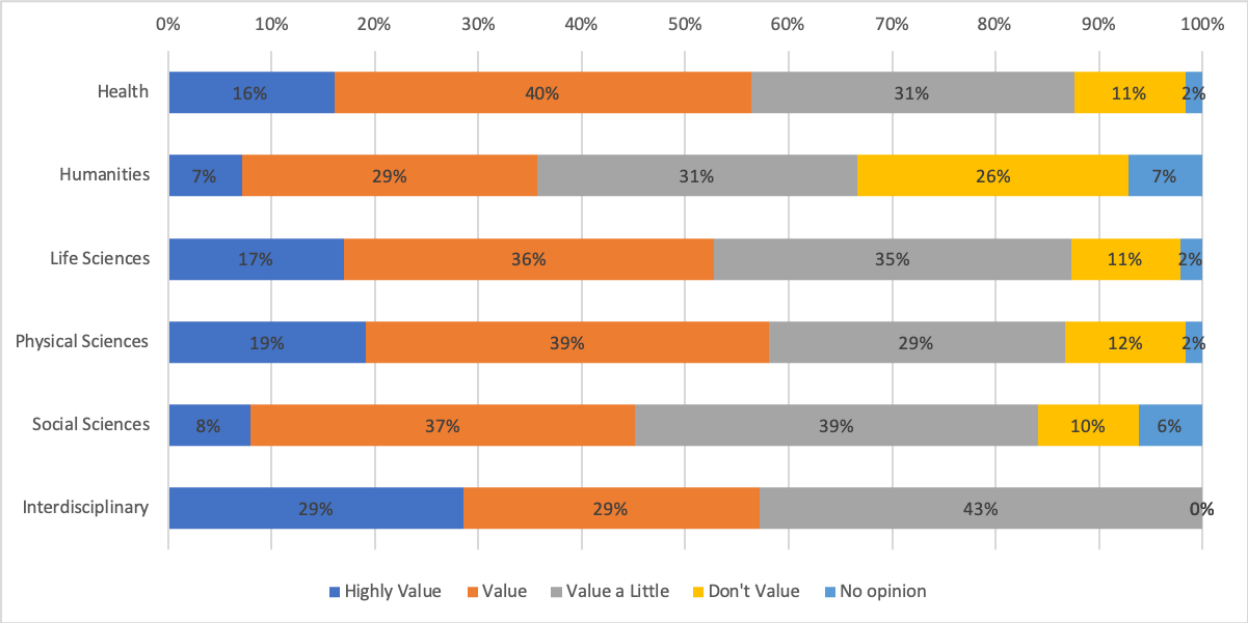


Figure 44: Ideal valuation of fellowship application criteria by reviewers: International collaboration. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 243, n = 42, n = 466, n = 241, n = 113, n = 7).

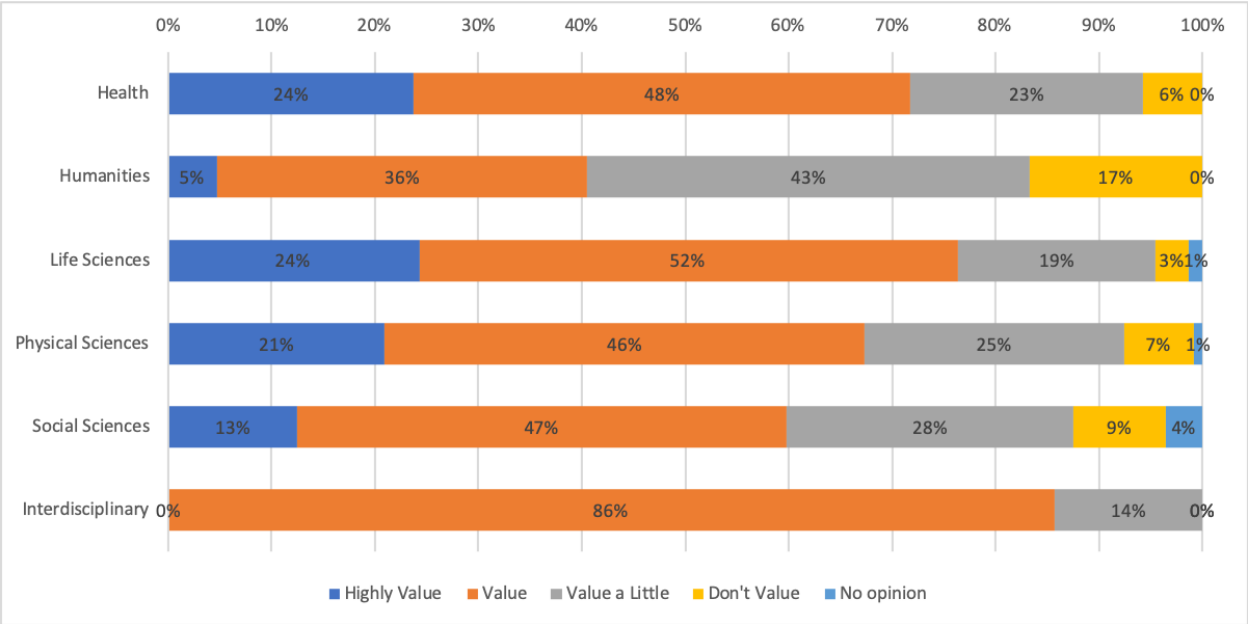


Figure 45: Ideal valuation of fellowship application criteria by reviewers: Mentorship activities. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 244, n = 42, n = 465, n = 239, n = 112, n = 7).

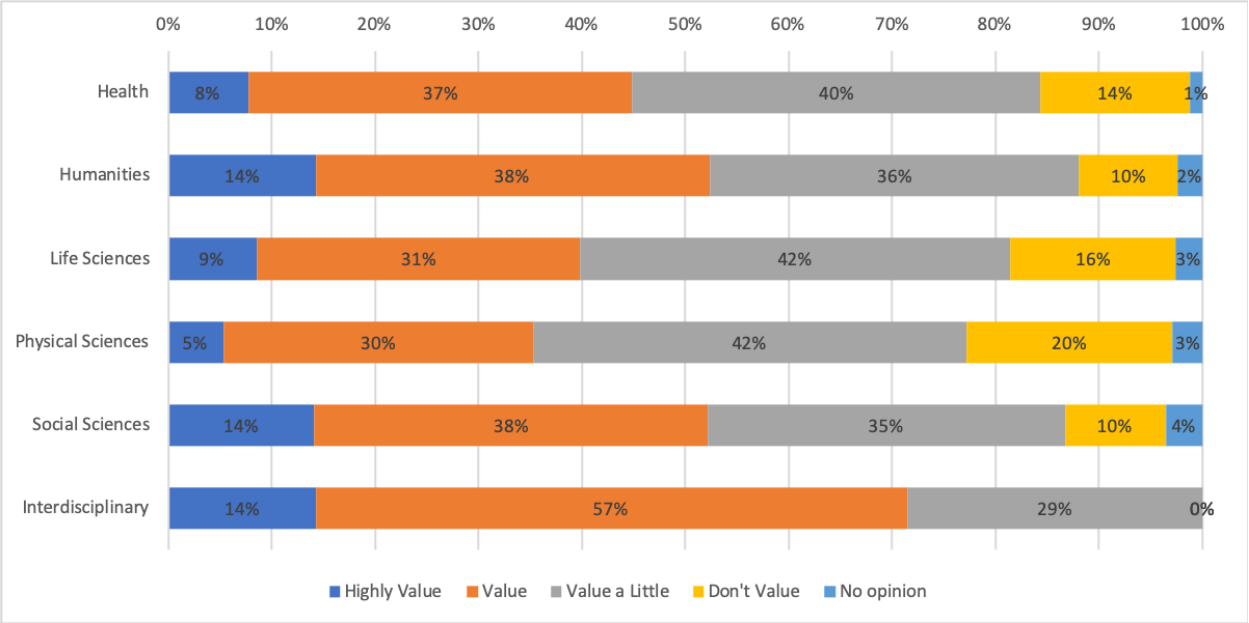


Figure 46: Ideal valuation of fellowship application criteria by reviewers: Non-academic publications. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 243, n = 42, n = 464, n = 241, n = 113, n = 7). Non-academic publications may include books, op-eds, blogs, and white papers.

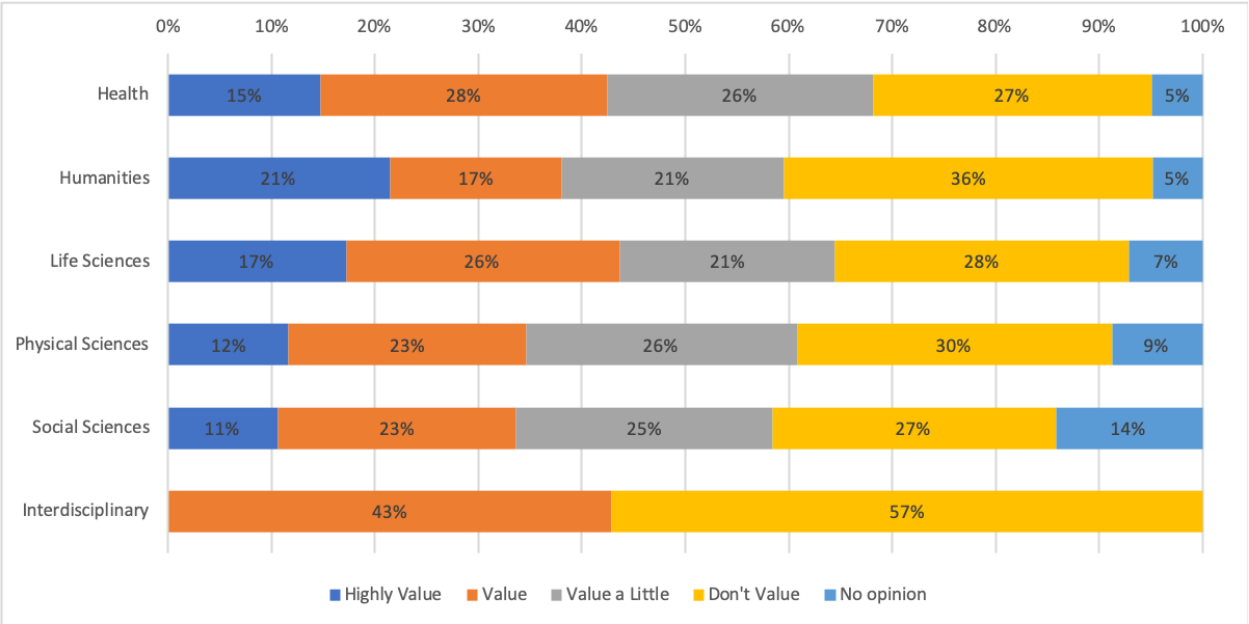


Figure 47: Ideal valuation of fellowship application criteria by reviewers: Periods of leave. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 245, n = 42, n = 465, n = 240, n = 113, n = 7). Periods of leave include those for academic, parental, personal health, familial health, or other reasons.

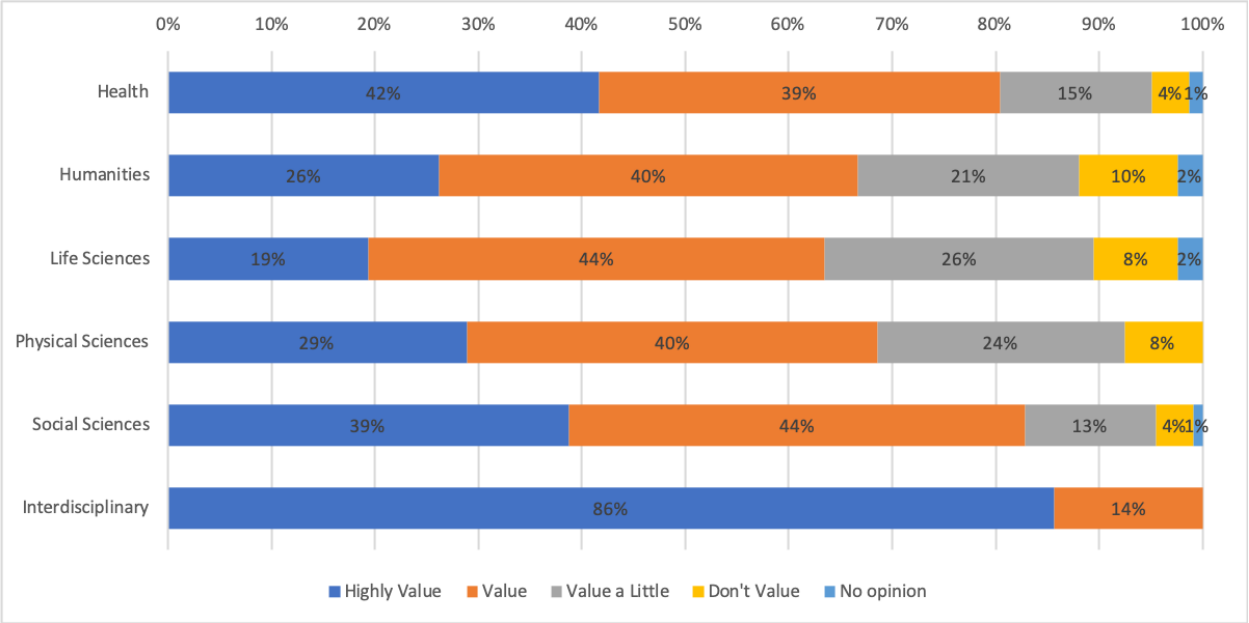


Figure 48: Ideal valuation of fellowship application criteria by reviewers: Potential societal impacts of the research. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 245, n = 42, n = 465, n = 239, n = 111, n = 7).

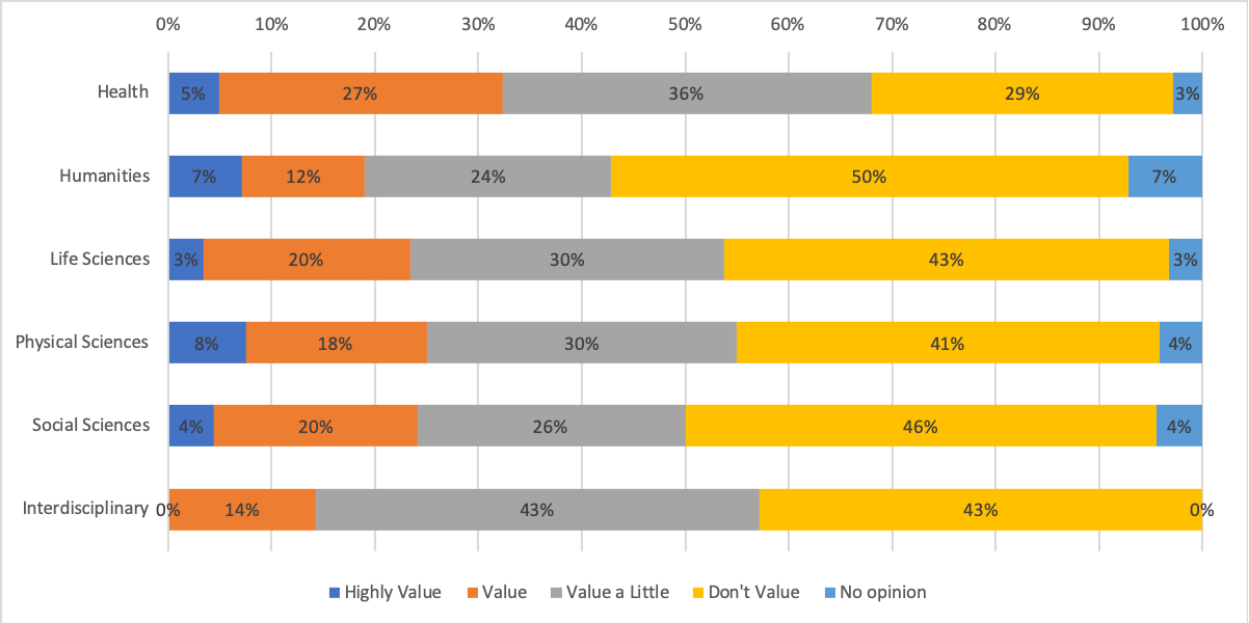


Figure 49: Ideal valuation of fellowship application criteria by reviewers: Prestige of the institution or of your supervisor. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 244, n = 42, n = 465, n = 240, n = 112, n = 7).

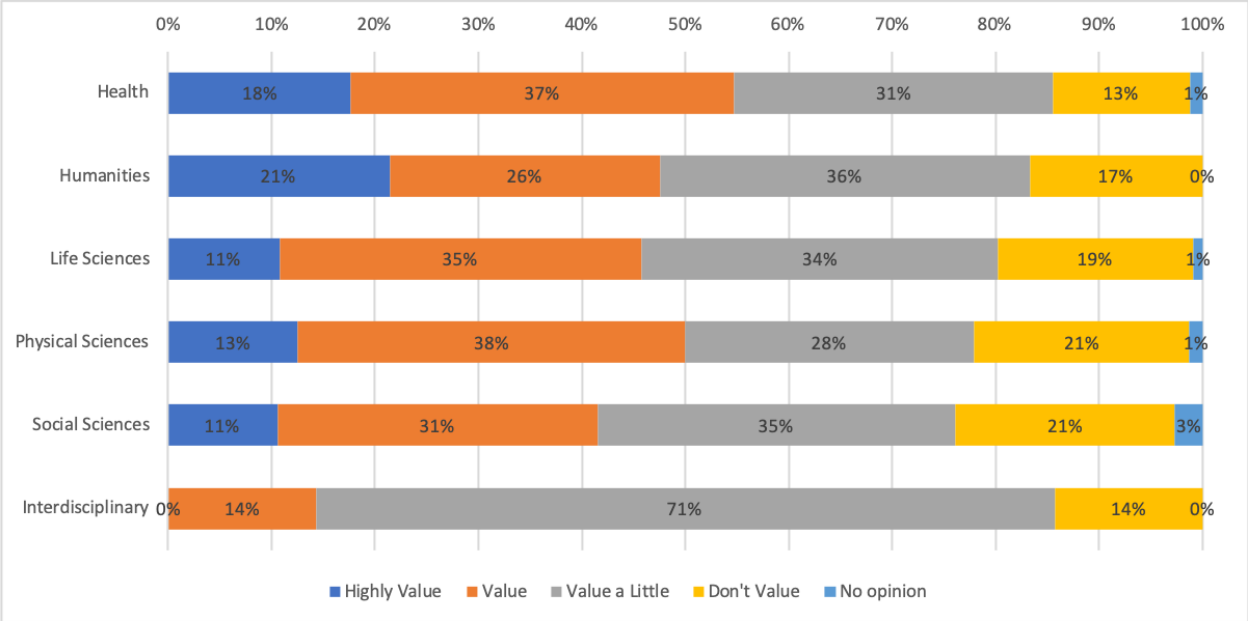


Figure 50: Ideal valuation of fellowship application criteria by reviewers: Previous success with awards (distinctions). Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 243, n = 42, n = 461, n = 240, n = 113, n = 7).

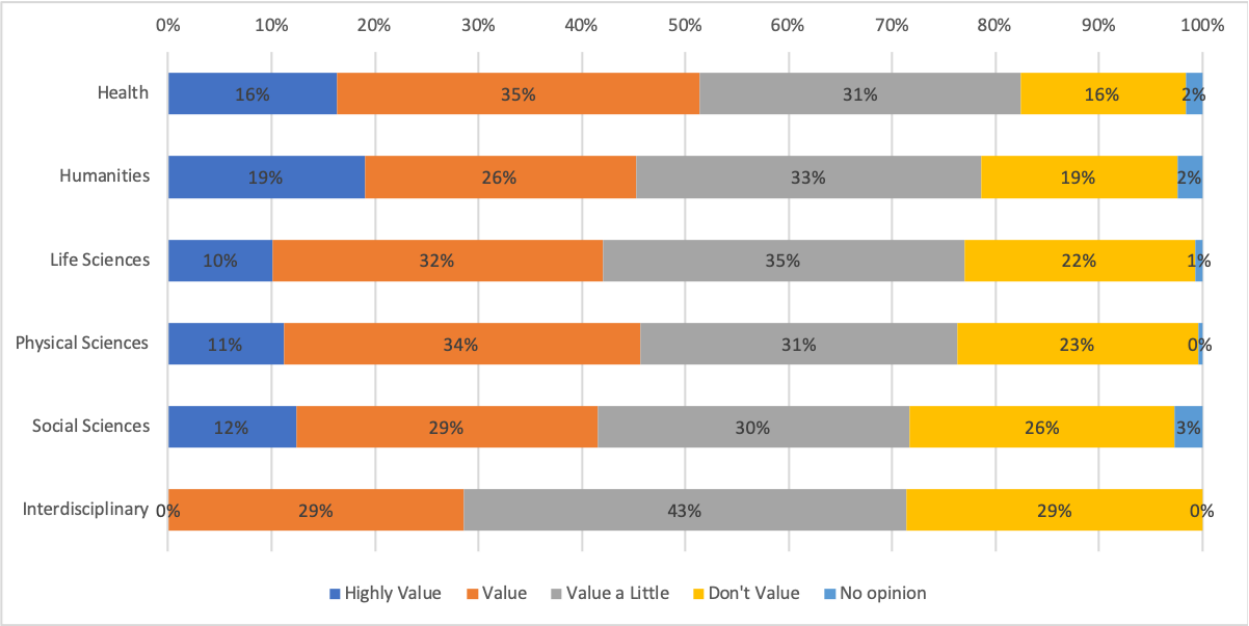


Figure 51: Ideal valuation of fellowship application criteria by reviewers: Previous success with scholarships and fellowships. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 245, n = 42, n = 466, n = 241, n = 113, n = 7).

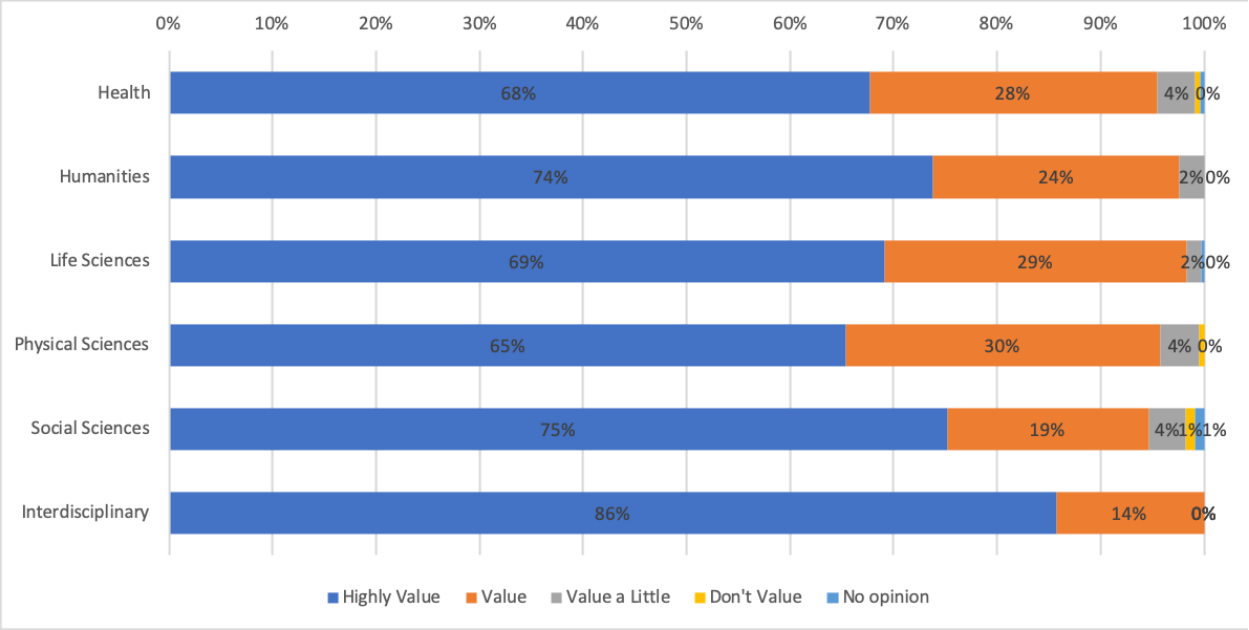


Figure 52: Ideal valuation of fellowship application criteria by reviewers: Project description / proposal. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 245, n = 42, n = 466, n = 240, n = 113, n = 7).

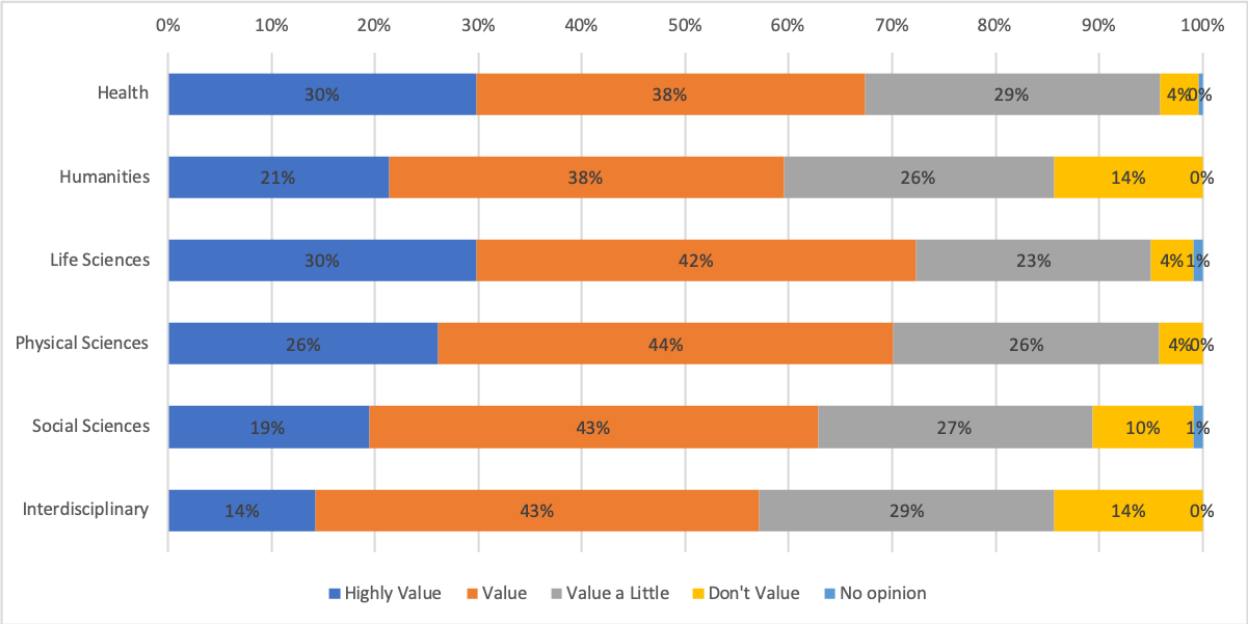


Figure 53: Ideal valuation of fellowship application criteria by reviewers: Publication record. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 245, n = 42, n = 466, n = 241, n = 113, n = 7).

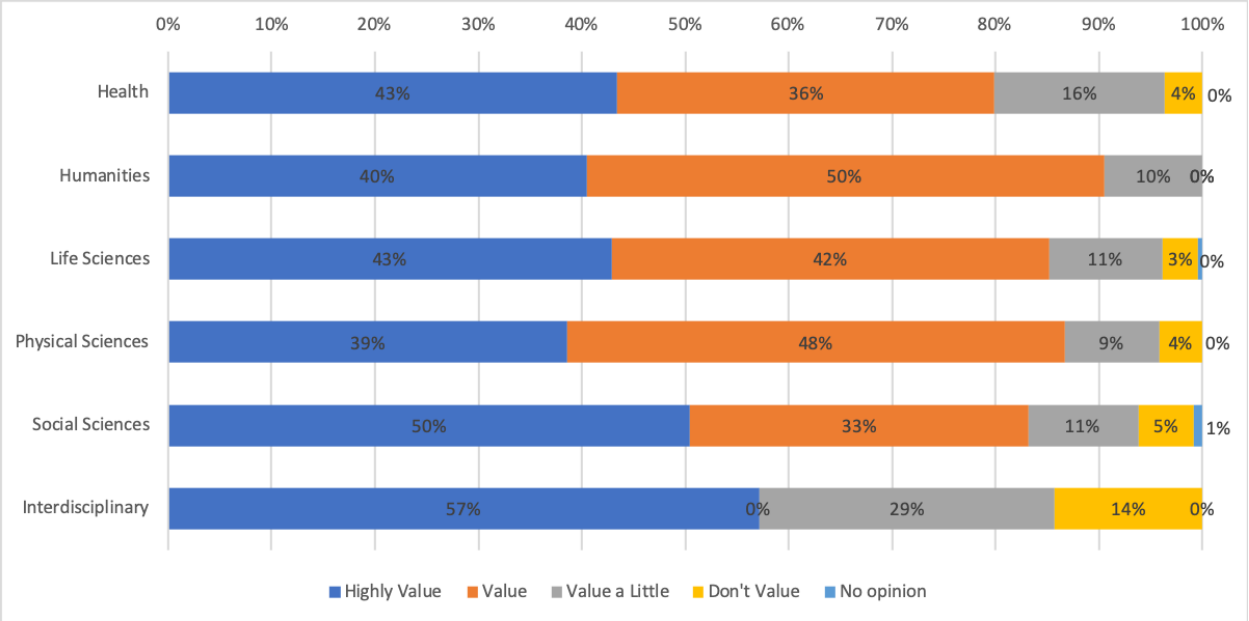


Figure 54: Ideal valuation of fellowship application criteria by reviewers: Reference letters. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 244, n = 42, n = 466, n = 241, n = 113, n = 7).

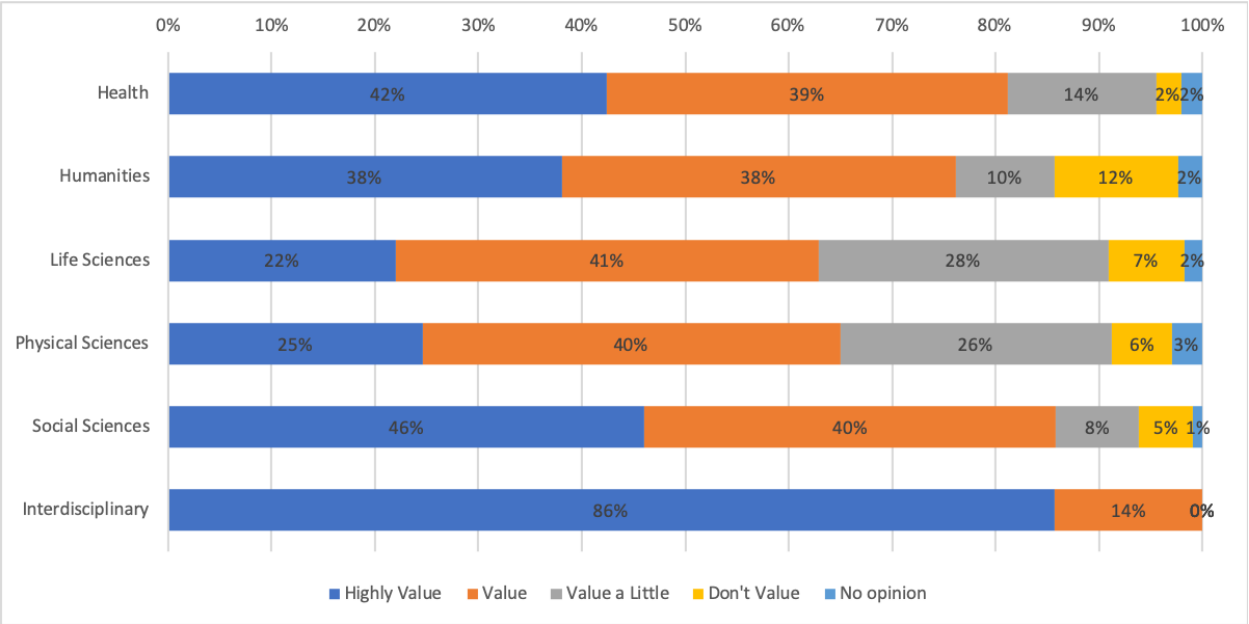


Figure 55: Ideal valuation of fellowship application criteria by reviewers: Societal importance of the challenge the research seeks to address. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 245, n = 42, n = 464, n = 240, n = 113, n = 7).

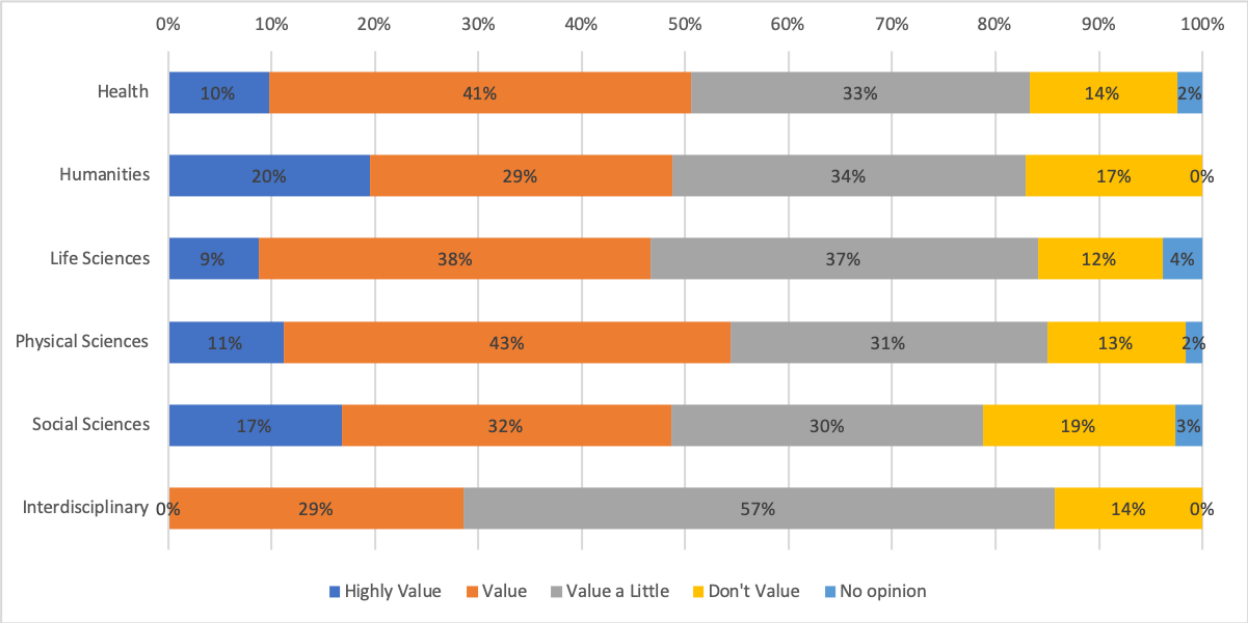


Figure 56: Ideal valuation of fellowship application criteria by reviewers: Teaching and TAship. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 245, n = 41, n = 465, n = 241, n = 113, n = 7).

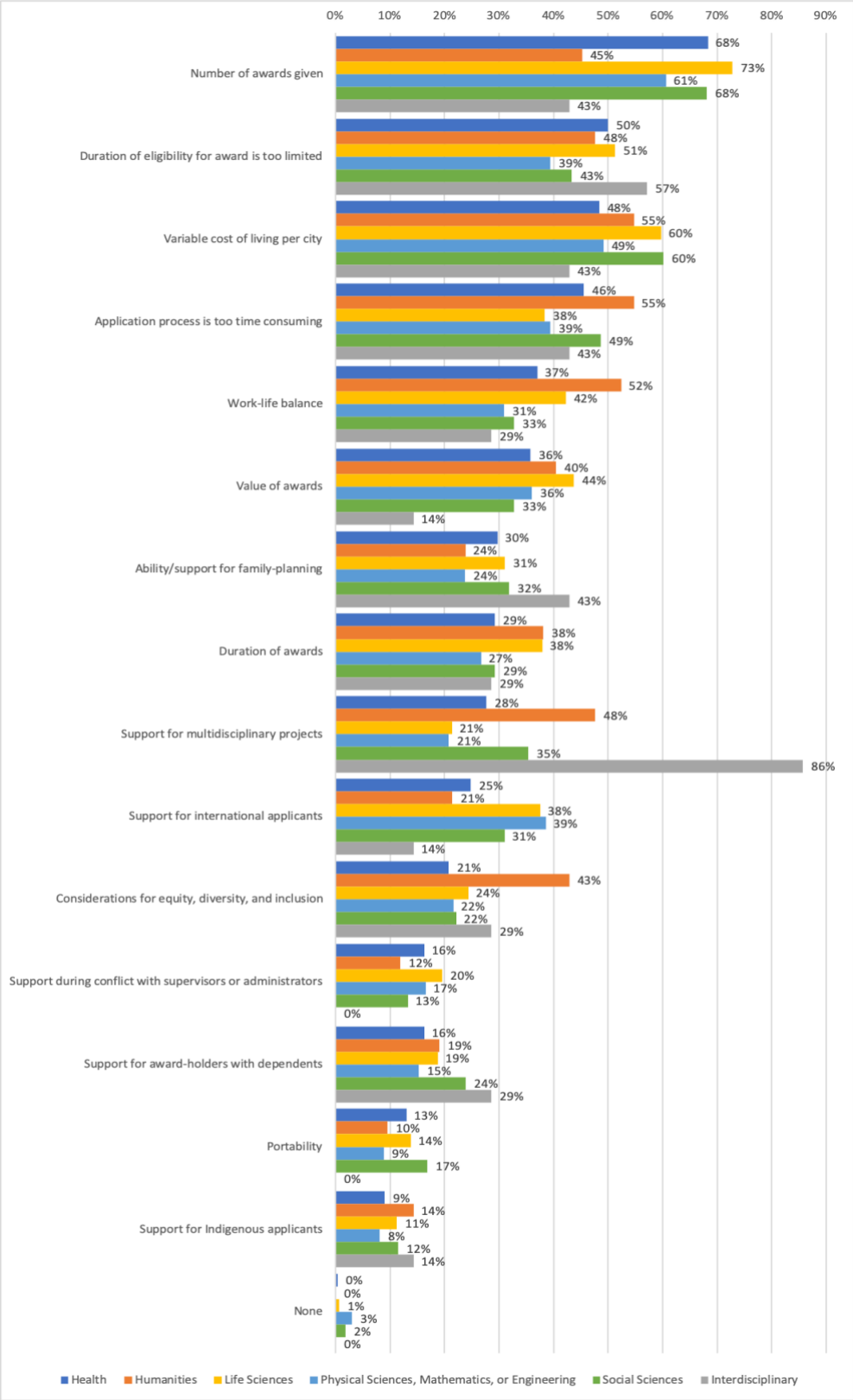


Figure 57: Barriers and problems for award opportunities, by percent. Respondents were asked to identify barriers they perceived or faced when applying to federal scholarships and fellowships (n = 246, n = 42, n = 464, n = 236, n = 113, n = 7). Multiple selections possible.

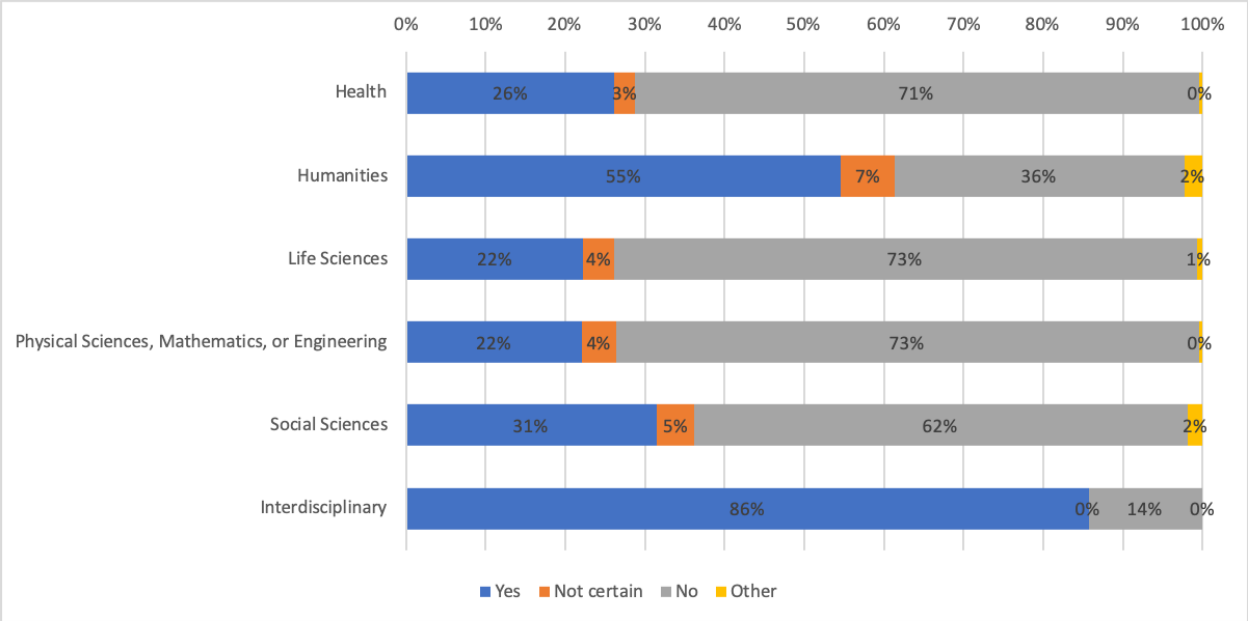


Figure 58: *Do you think your field of research is not adequately represented by the awards opportunities available from CIHR, NSERC, or SSHRC?* By percent (n = 237, n = 44, n = 455, n = 227, n = 108, n = 7).

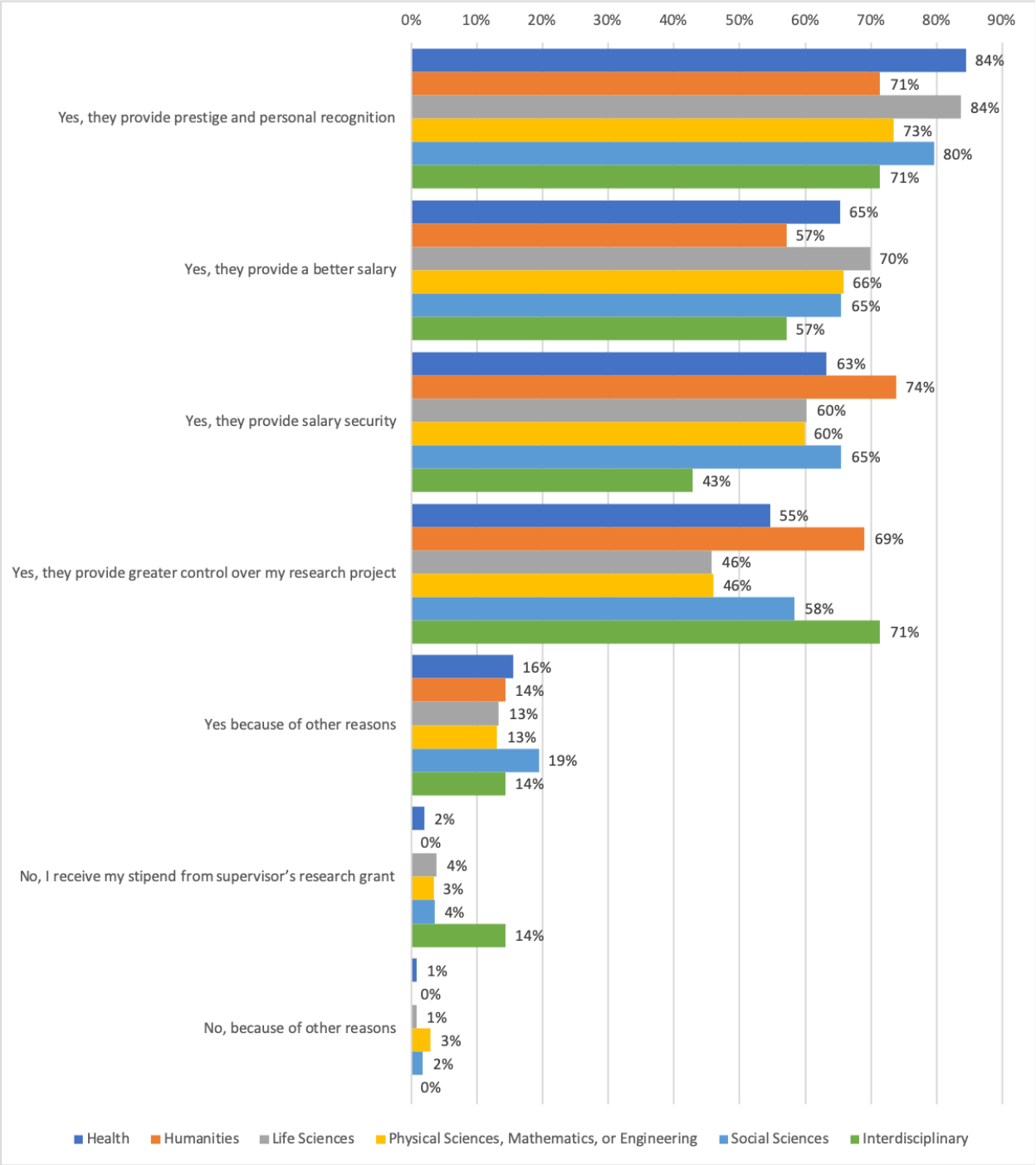


Figure 59: Benefits of obtaining funding from awards, rather than from supervisor's research grant, by percent (n = 245, n = 42, n = 465, n = 237, n = 113, n = 7). Multiple selections possible.

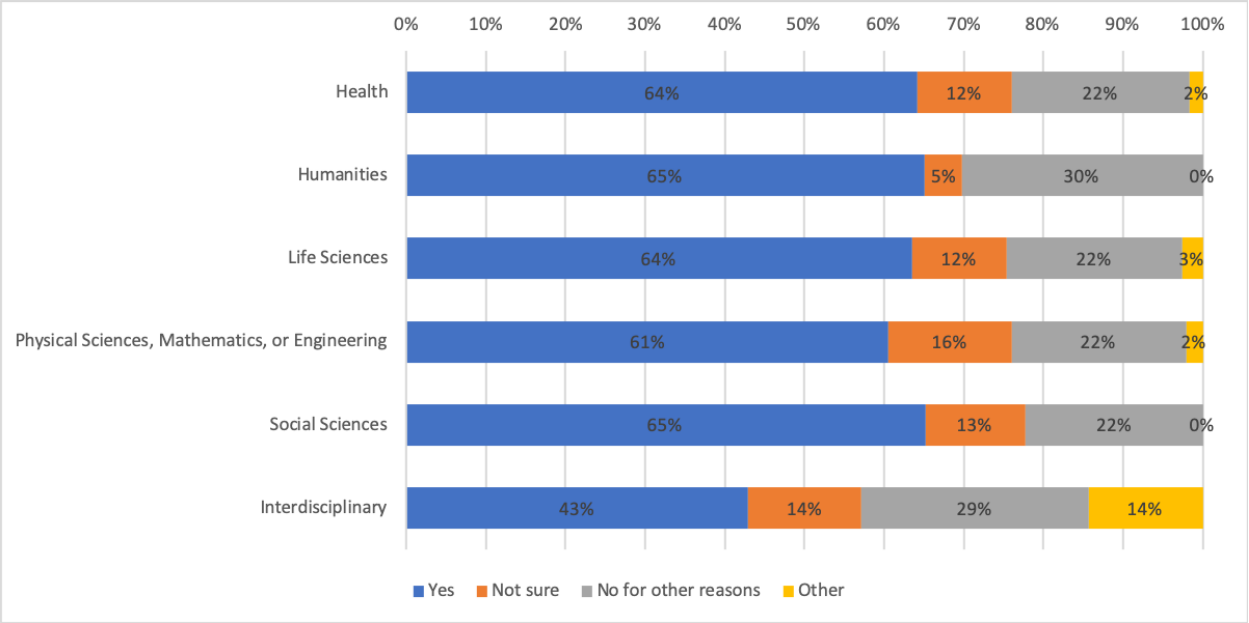


Figure 60: *Do you think that scholarships and fellowships should help to prepare trainees for diverse careers outside of academia?* By percent (n = 246, n = 43, n = 464, n = 238, n = 112, n = 7).

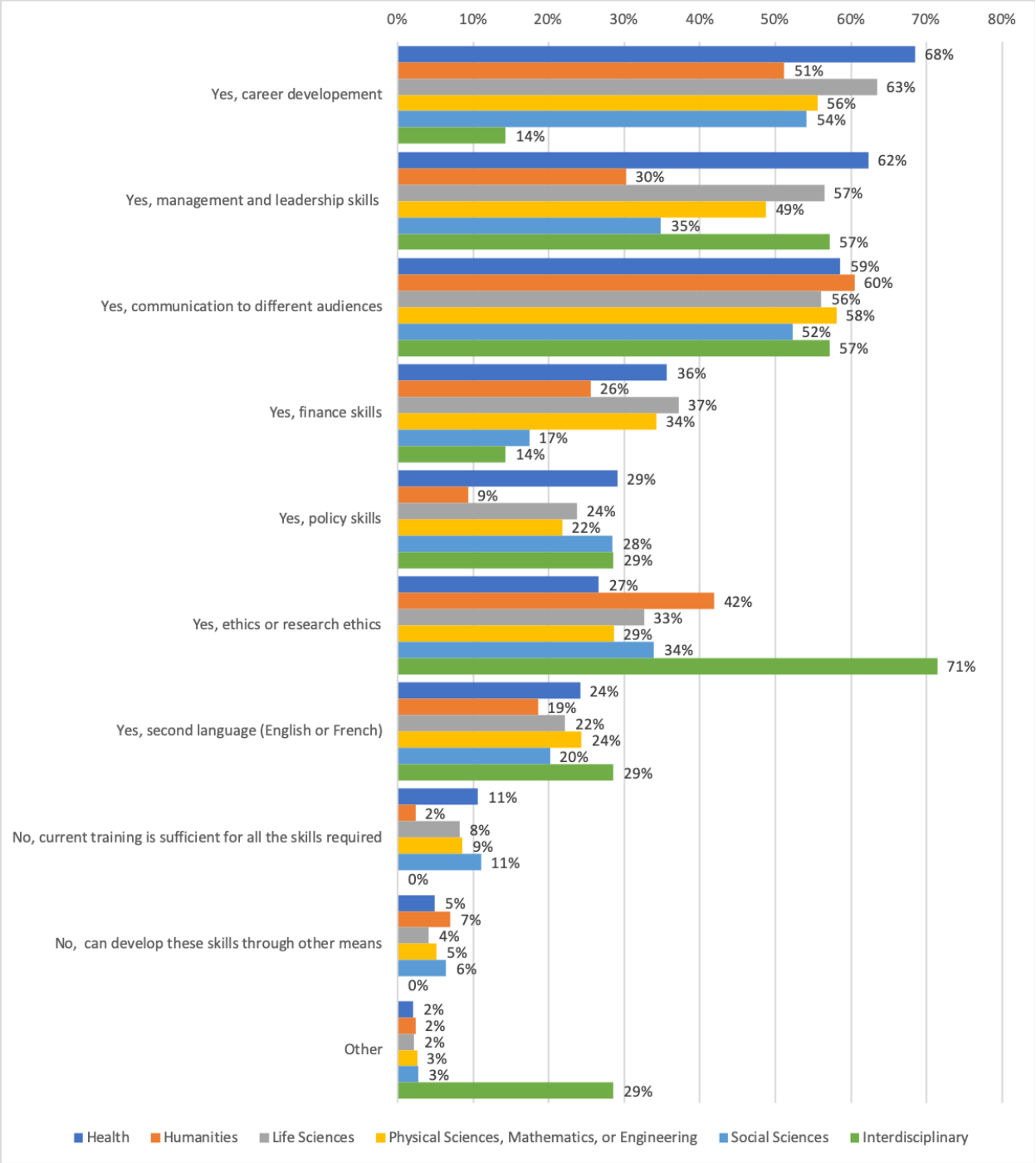


Figure 61: Skills desired to be incorporated into academic training, by percent. Multiple responses possible (n = 244, n = 43, n = 460, n = 234, n = 109, n = 7).

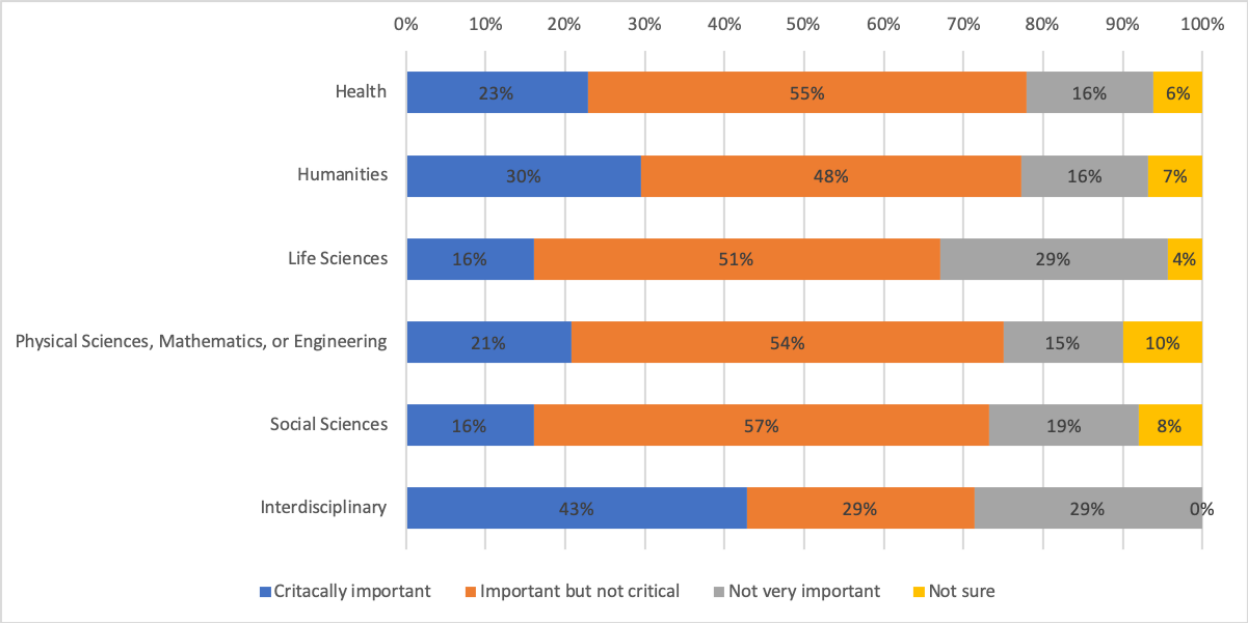


Figure 62: Importance of elite awards, by percent. Respondents were asked to evaluate the importance of the elite Vanier doctoral and Banting postdoctoral awards (n = 245, n = 44, n = 462, n = 241, n = 112, n = 7).

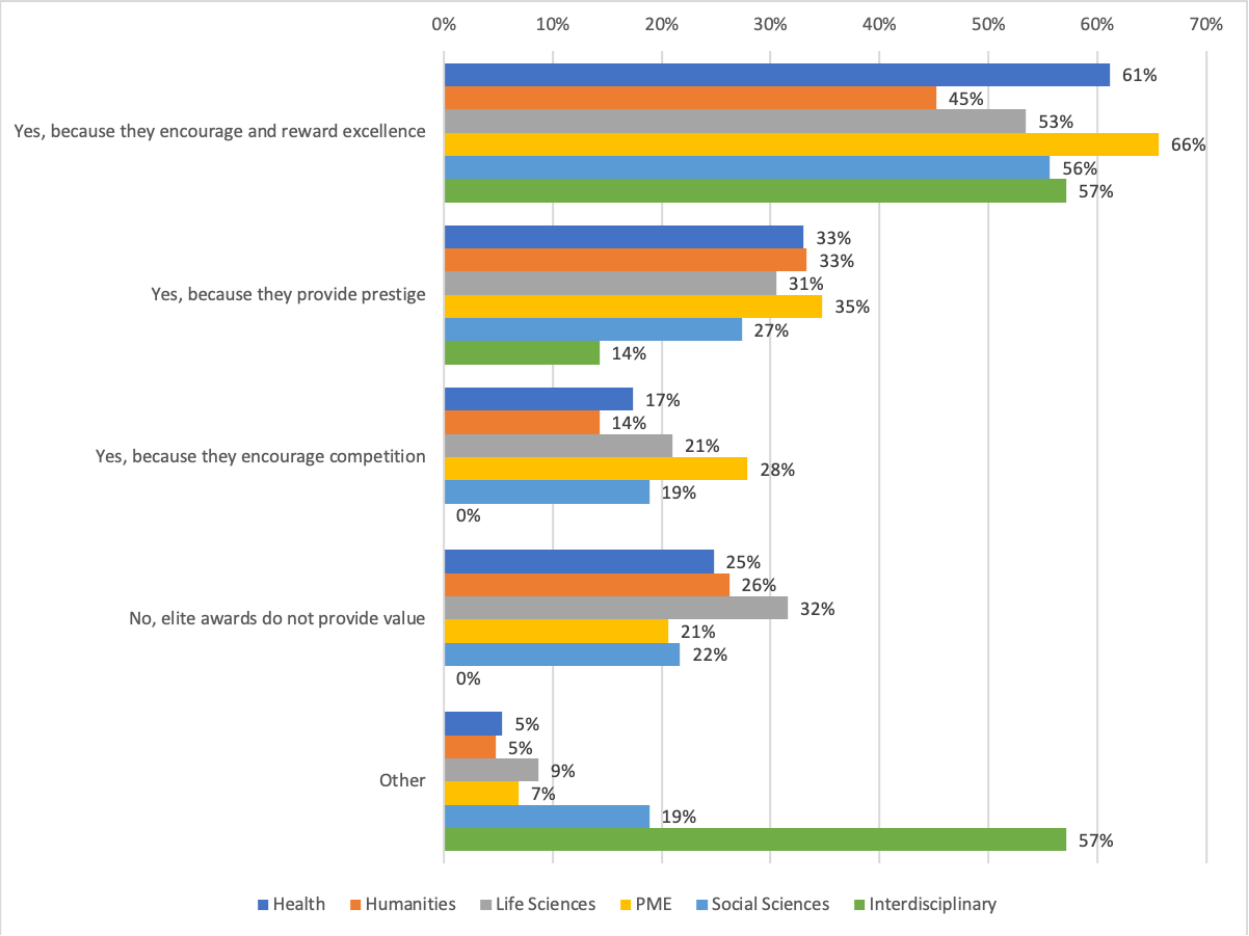


Figure 63: *Are elite awards a beneficial part of the current funding system?* Multiple selections possible (n = 242, n = 42, n = 462, n = 233, n = 106, n = 7). (figure on previous page)

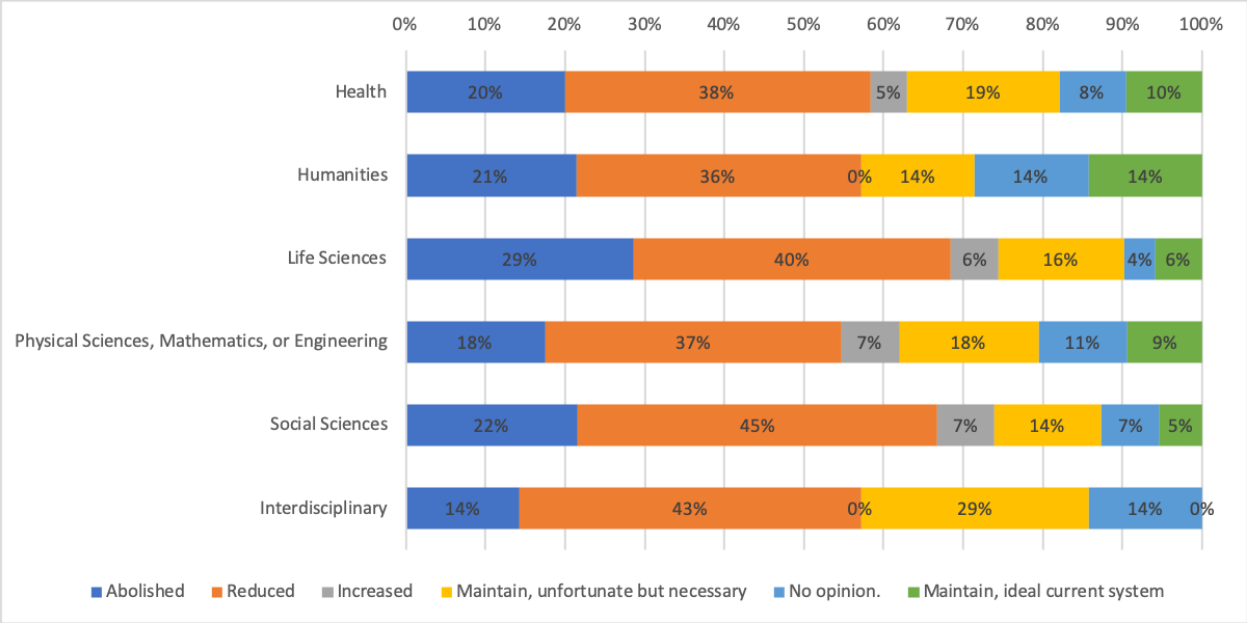


Figure 64: Recommendations for the elite awards system, by percent. Elite awards provide greater levels of support and prestige for select trainees, but the investment required reduces the total number of potential awards available. In considering this, applicants were asked to state their opinion of the current elite awards system (n = 240, n = 42, n = 462, n = 234, n = 111, n = 7).

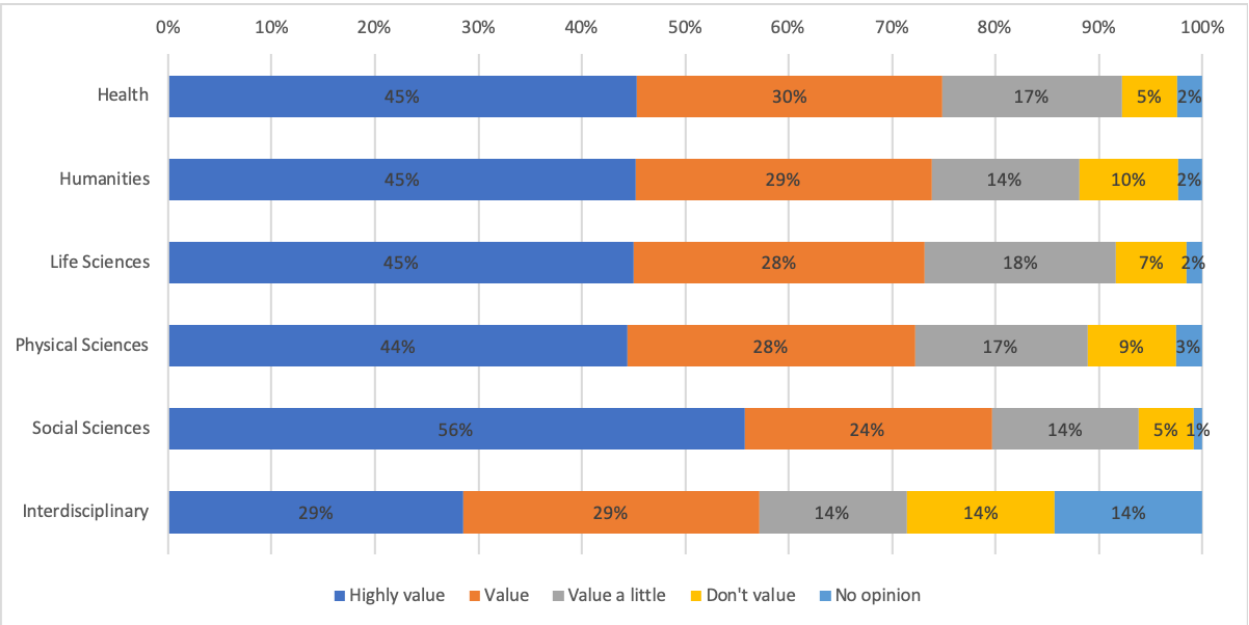


Figure 65: Valuation of the following factor given an increase in the federal budget: Increasing value of all scholarships and fellowships. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 243, n = 42, n = 455, n = 234, n = 113, n = 7).

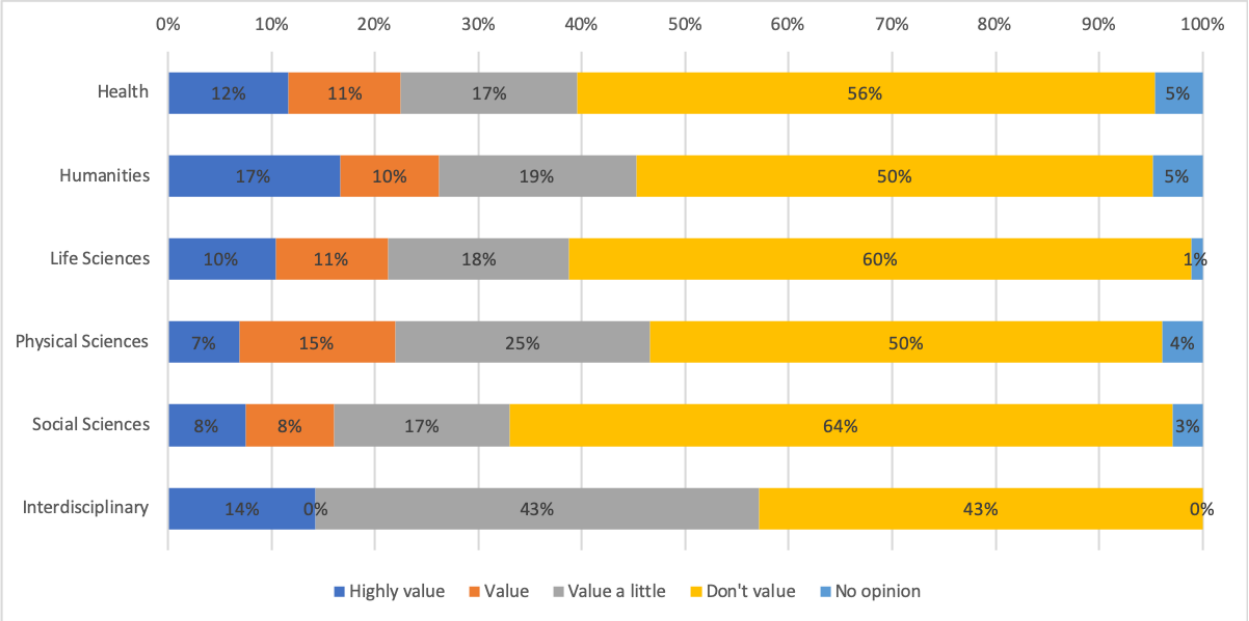


Figure 66: Valuation of the following factor given an increase in the federal budget: Increasing value of elite awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 240, n = 42, n = 451, n = 232, n = 106, n = 7).

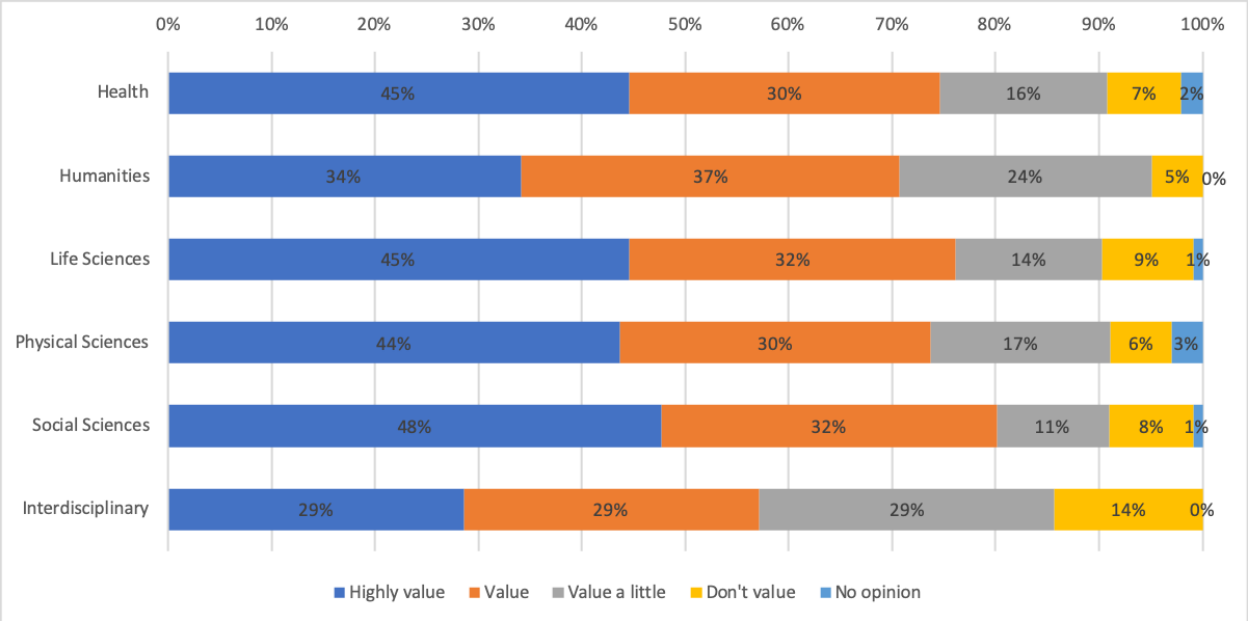


Figure 67: Valuation of the following factor given an increase in the federal budget: Increasing value of standard awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 240, n = 41, n = 453, n = 236, n = 111, n = 7).

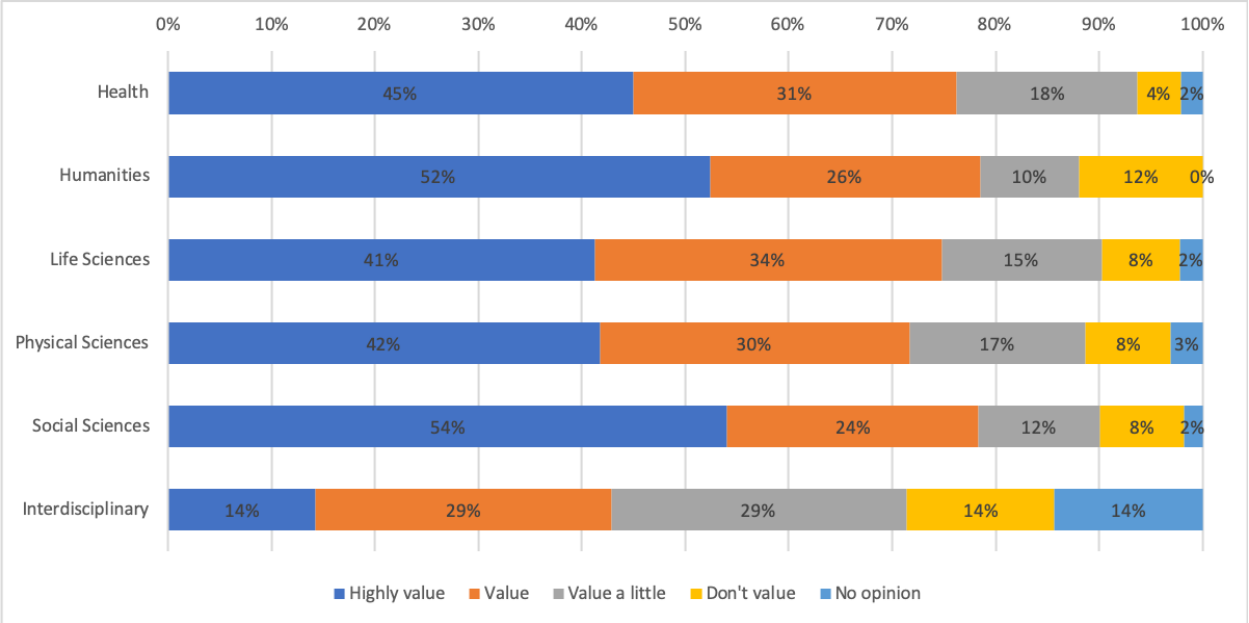


Figure 68: Valuation of the following factor given an increase in the federal budget: Increasing value of all graduate student awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 240, n = 42, n = 453, n = 230, n = 111, n = 7).

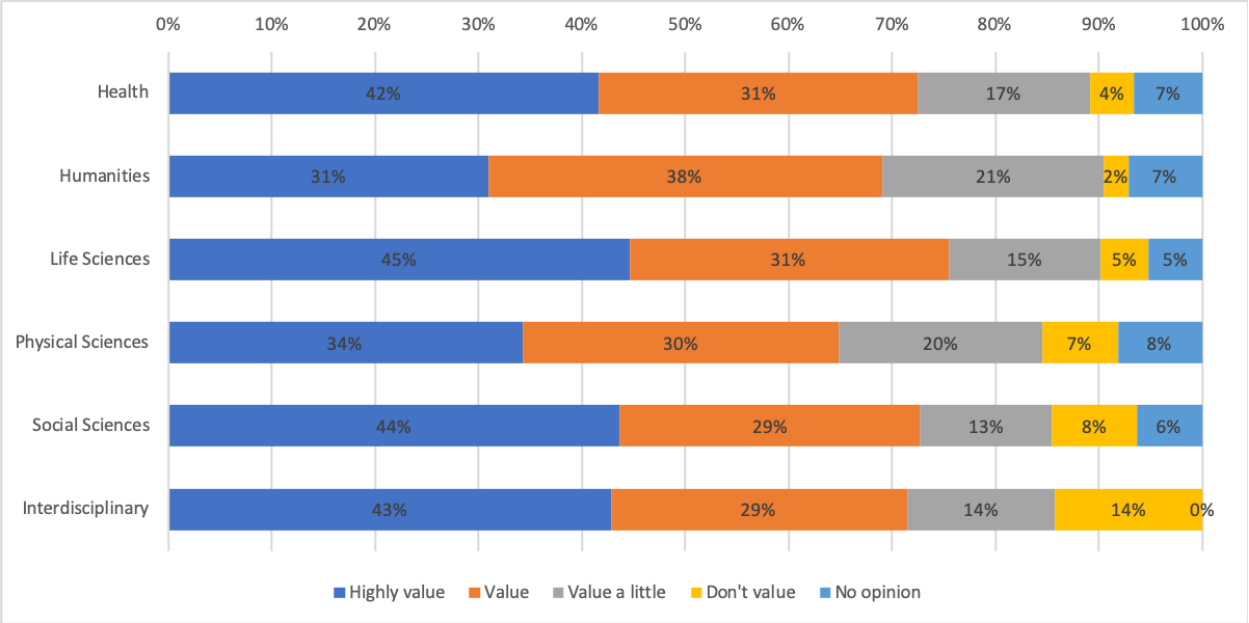


Figure 69: Valuation of the following factor given an increase in the federal budget: Increasing value of postdoctoral awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 240, n = 42, n = 457, n = 233, n = 110, n = 7).

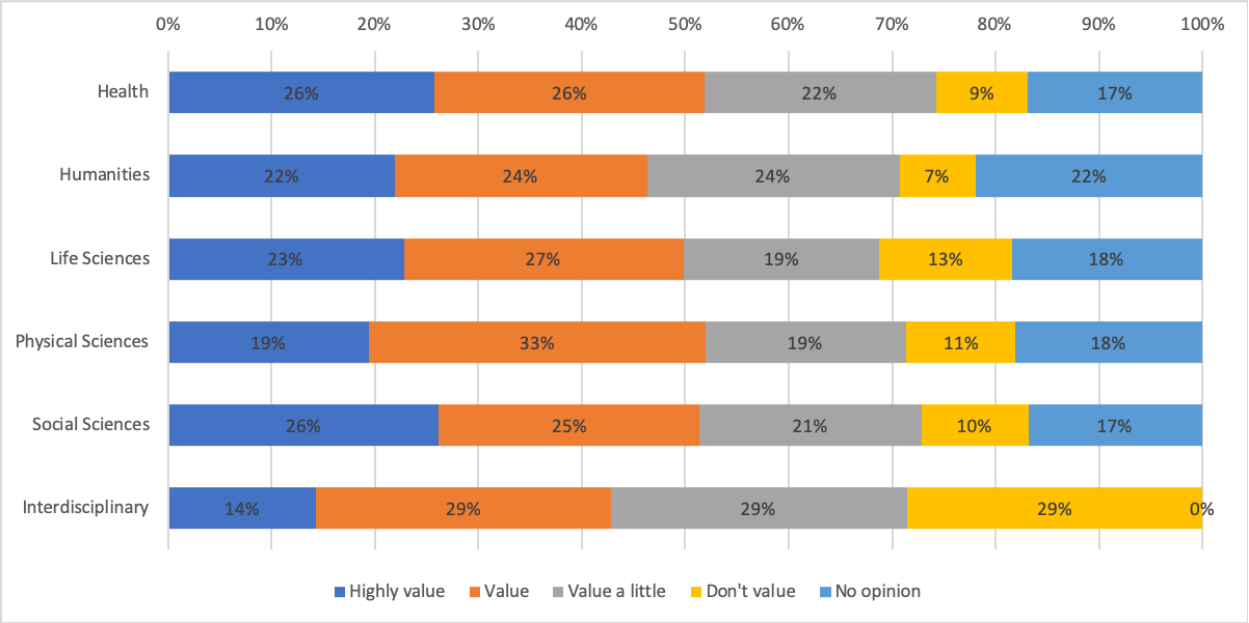


Figure 70: Valuation of the following factor given an increase in the federal budget: Increasing the value of specifically PGS-D Awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 237, n = 41, n = 451, n = 227, n = 107, n = 7).

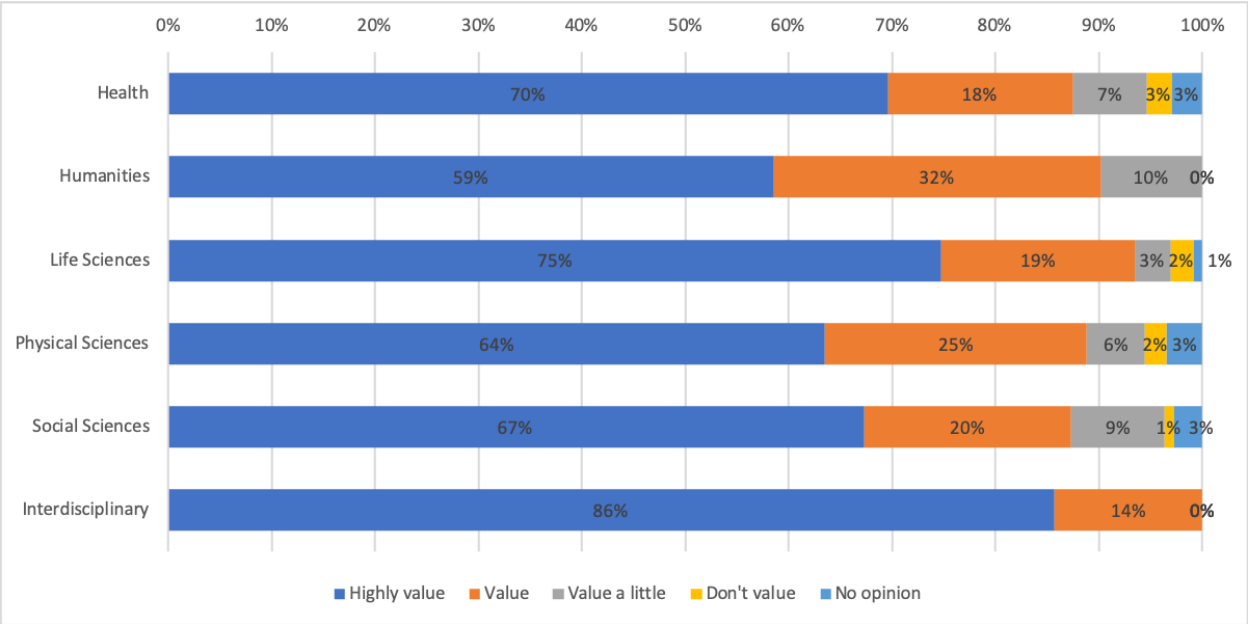


Figure 71: Valuation of the following factor given an increase in the federal budget: Increasing the total number of fellowships given. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 240, n = 41, n = 460, n = 223, n = 110, n = 7).

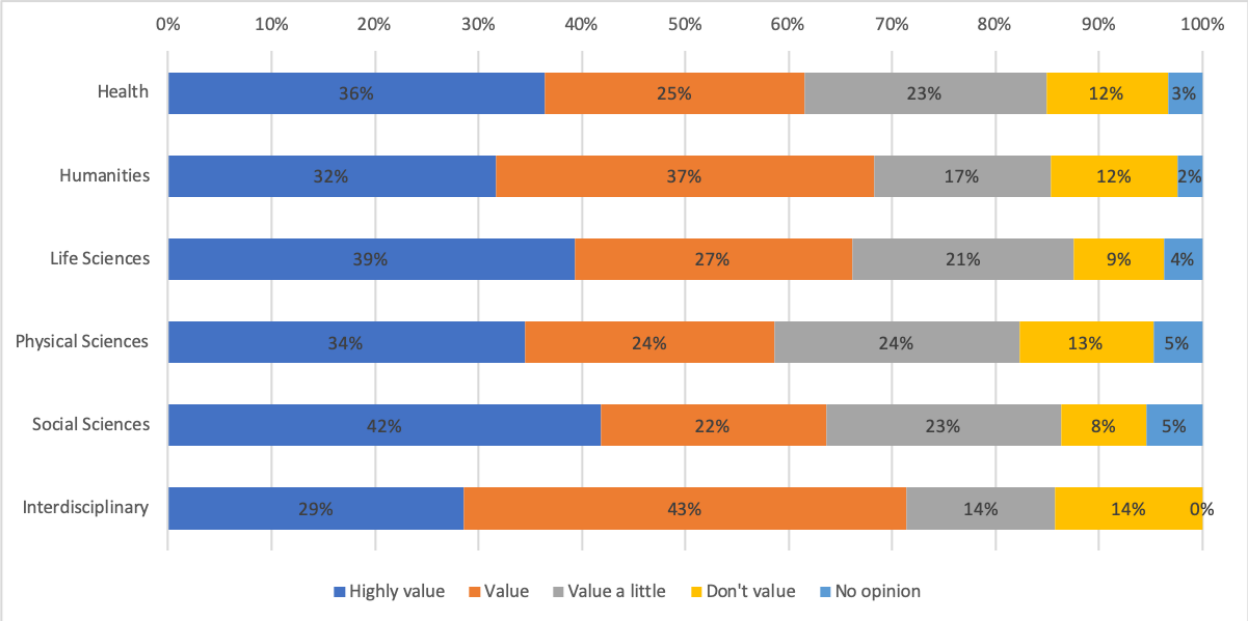


Figure 72: Valuation of the following factor given an increase in the federal budget: Increasing length of awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 239, n = 41, n = 458, n = 232, n = 110, n = 7).

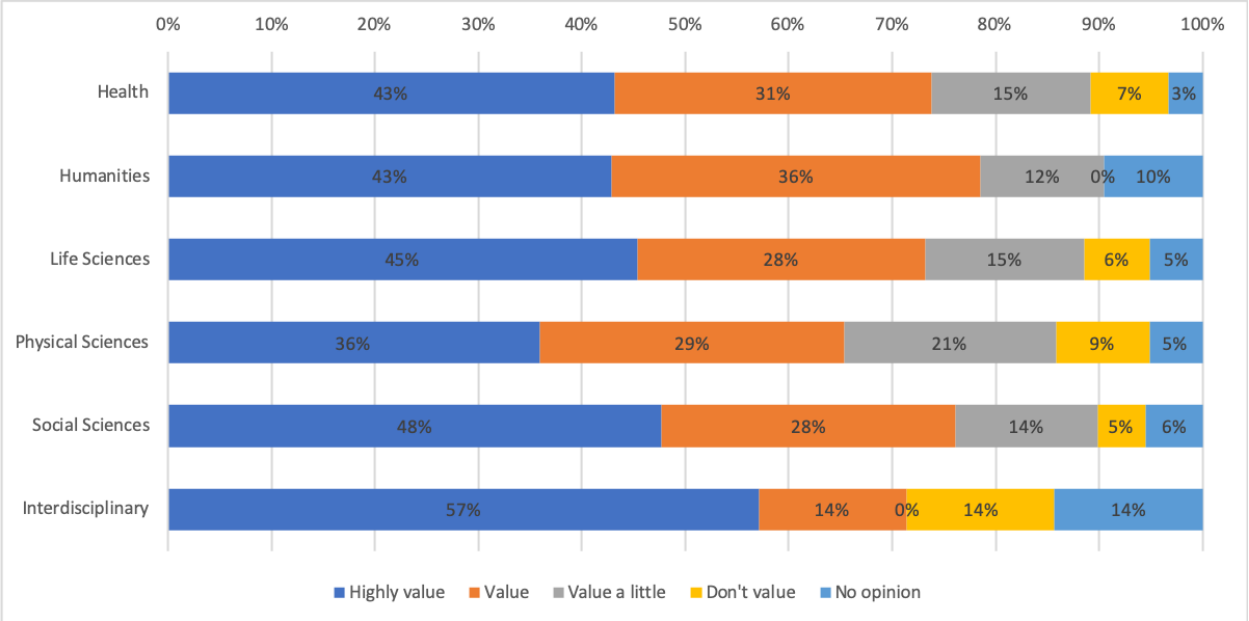


Figure 73: Valuation of the following factor given an increase in the federal budget: Increasing eligibility time of awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 241, n = 42, n = 456, n = 234, n = 109, n = 7).

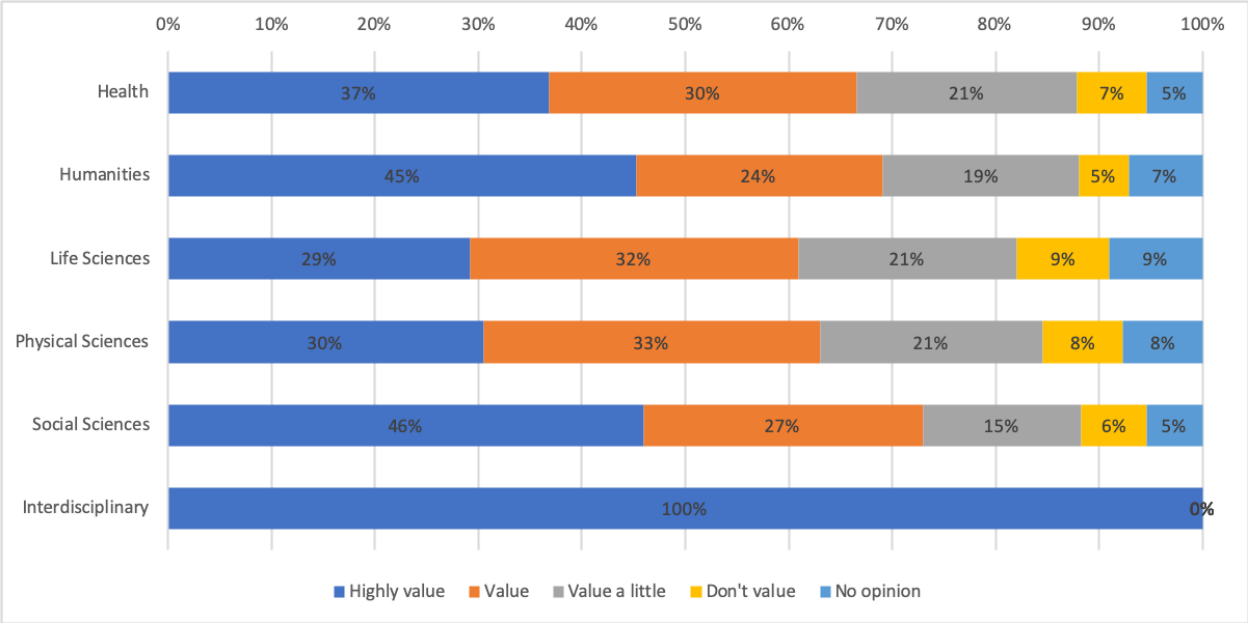


Figure 74: Valuation of the following factor given an increase in the federal budget: Increasing the number of interdisciplinary awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 239, n = 42, n = 456, n = 233, n = 111, n = 7).

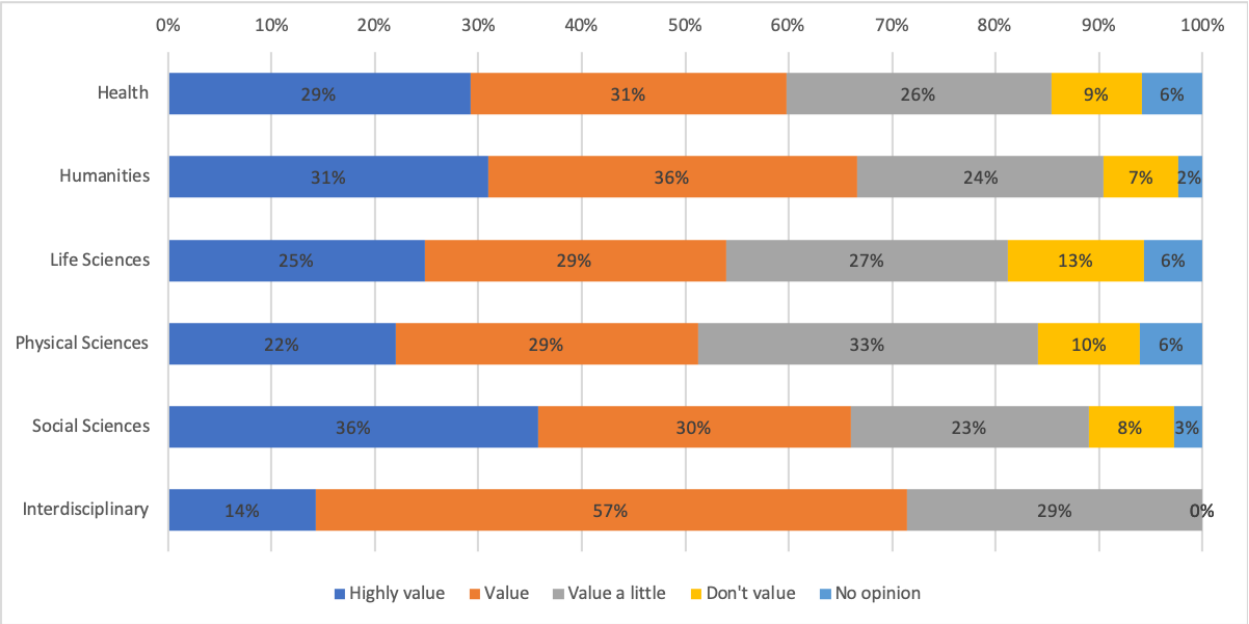


Figure 75: Valuation of the following factor given an increase in the federal budget: Increasing the number of travel awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 239, n = 42, n = 456, n = 232, n = 109, n = 7).

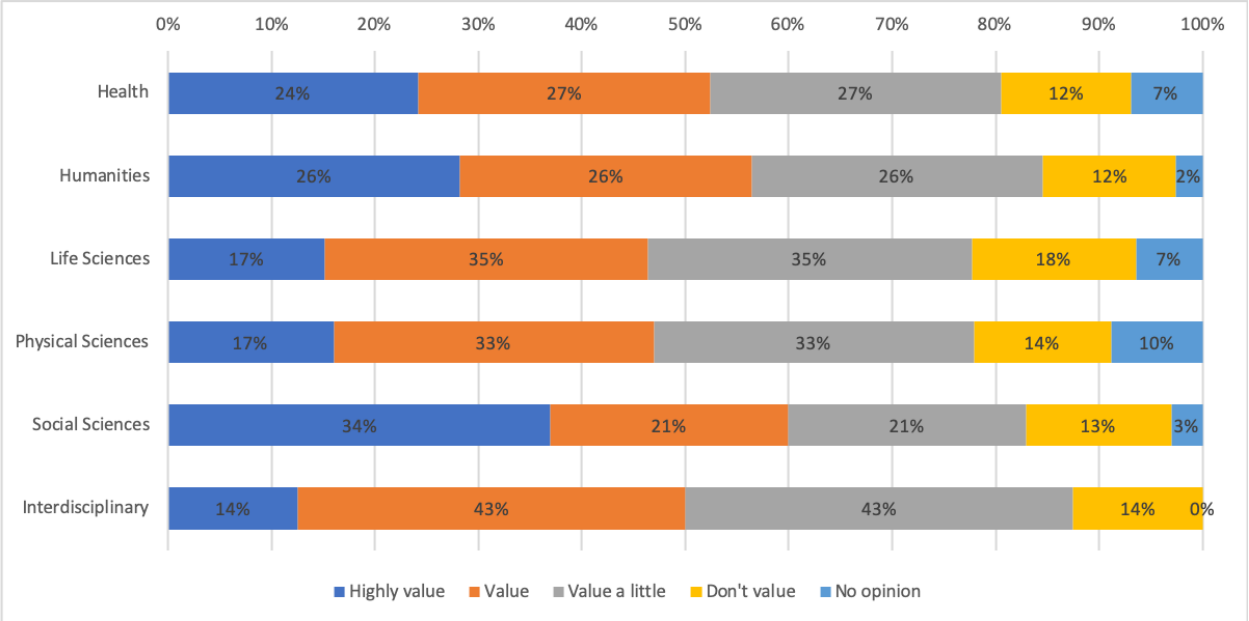


Figure 76: Valuation of the following factor given an increase in the federal budget: Increasing value of travel awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 237, n = 42, n = 450, n = 231, n = 108, n = 7).

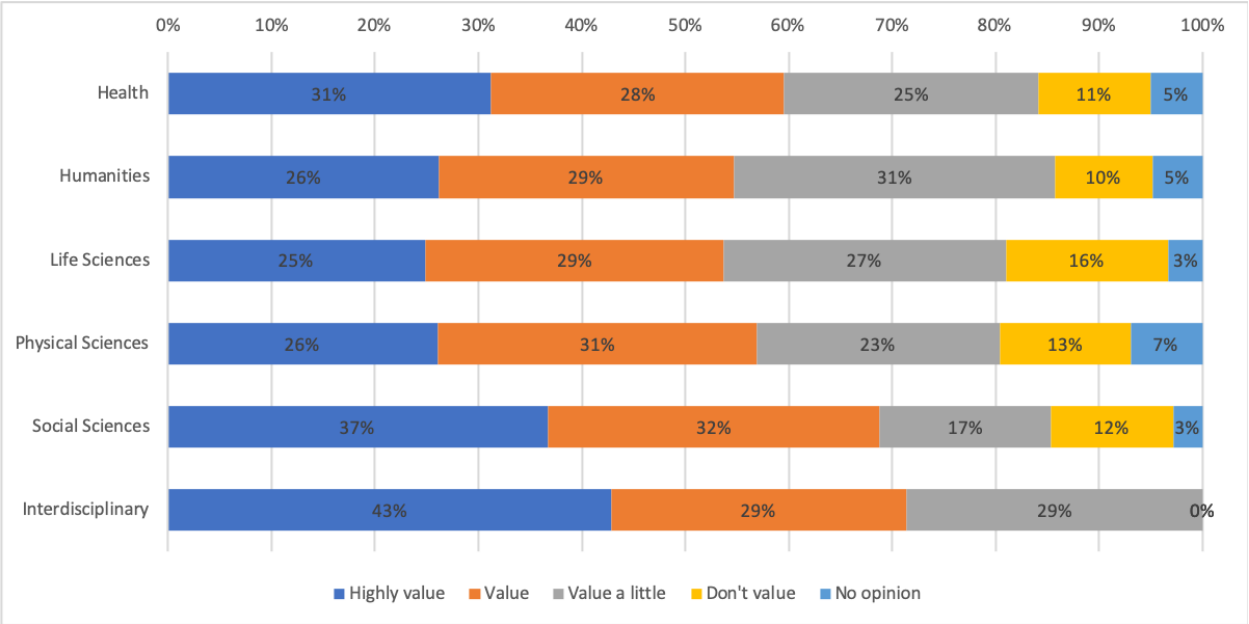


Figure 77: Valuation of the following factor given an increase in the federal budget: Increasing awards for outreach/engagement activities. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 240, n = 42, n = 454, n = 230, n = 109, n = 7).

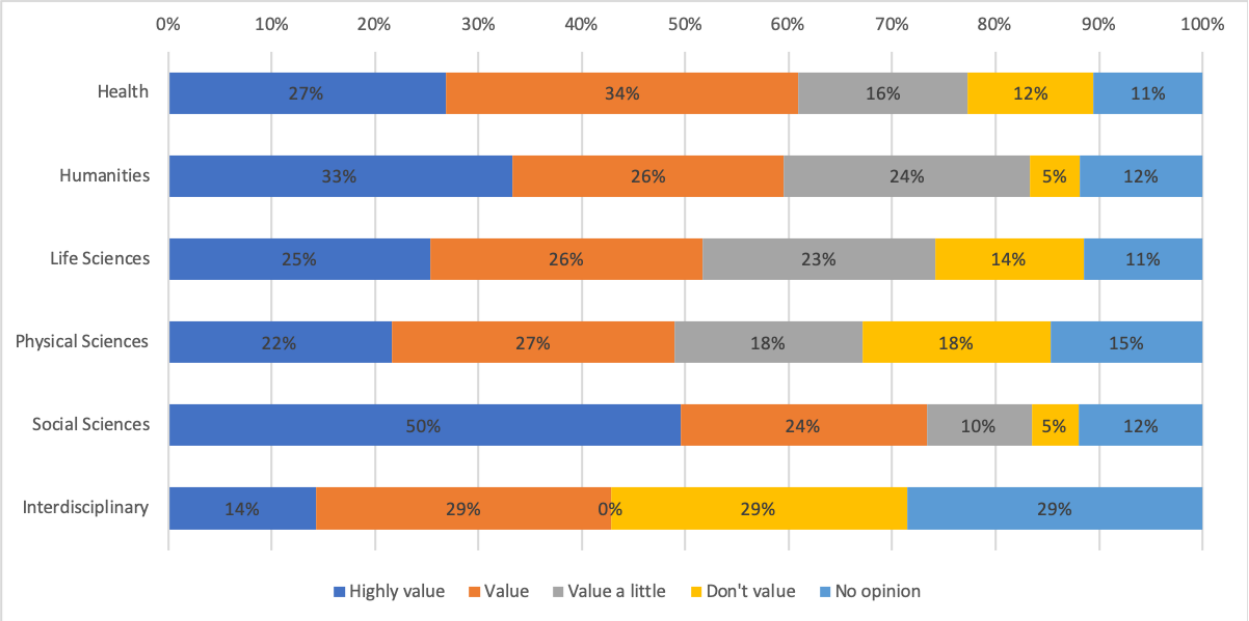


Figure 78: Valuation of the following factor given an increase in the federal budget: Harmonizing value amount of awards across CIHR, NSERC, SSHRC. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 238, n = 42, n = 453, n = 231, n = 109, n = 7).

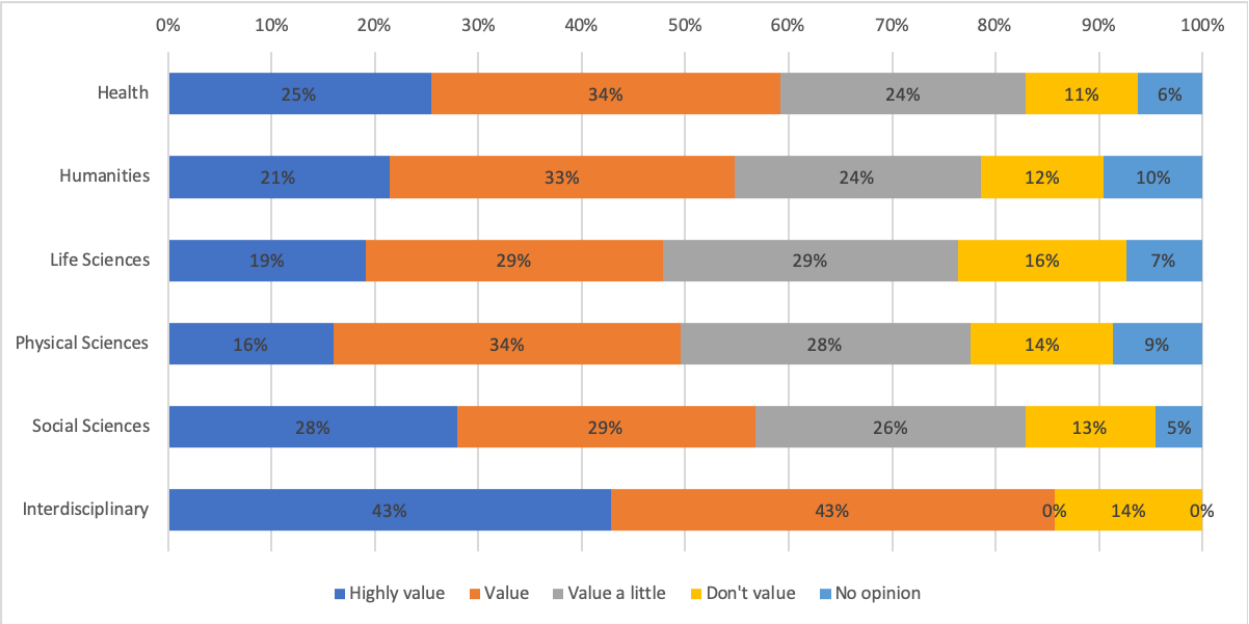


Figure 79: Valuation of the following factor given an increase in the federal budget: Including skills or impact-oriented activities as criteria for evaluation for all awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 240, n = 42, n = 449, n = 232, n = 111, n = 7).

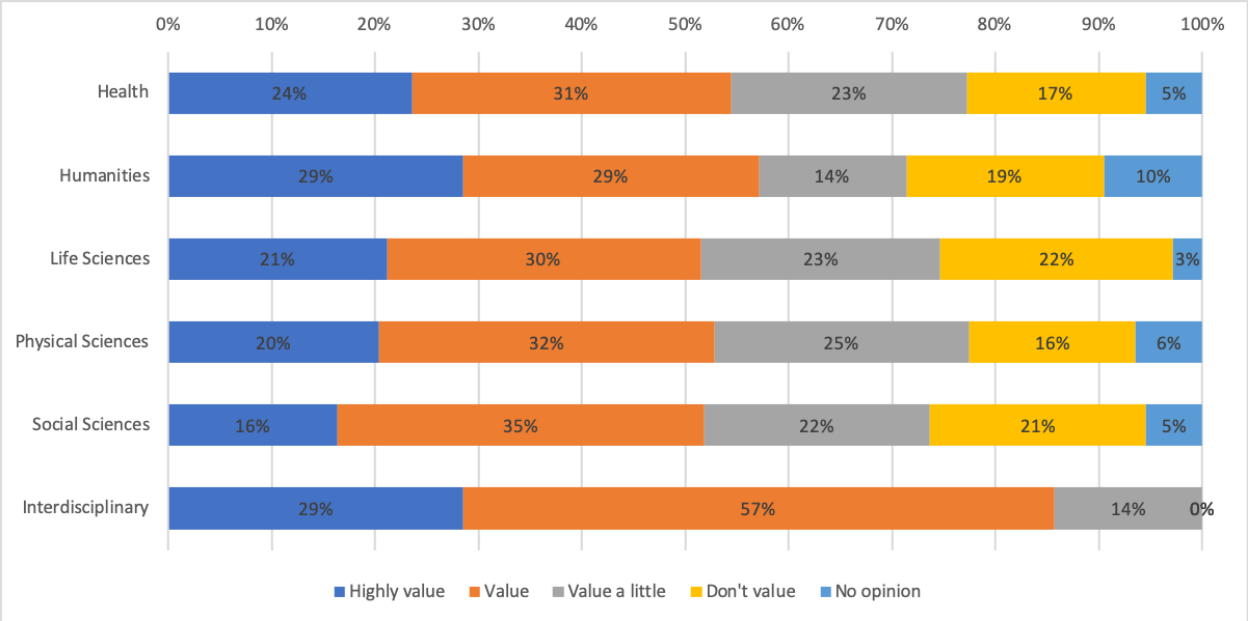


Figure 80: Valuation of the following factor given an increase in the federal budget: Including reports to be filled out by awardees at the end of the award to track outcomes. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 237, n = 42, n = 454, n = 231, n = 110, n = 7).

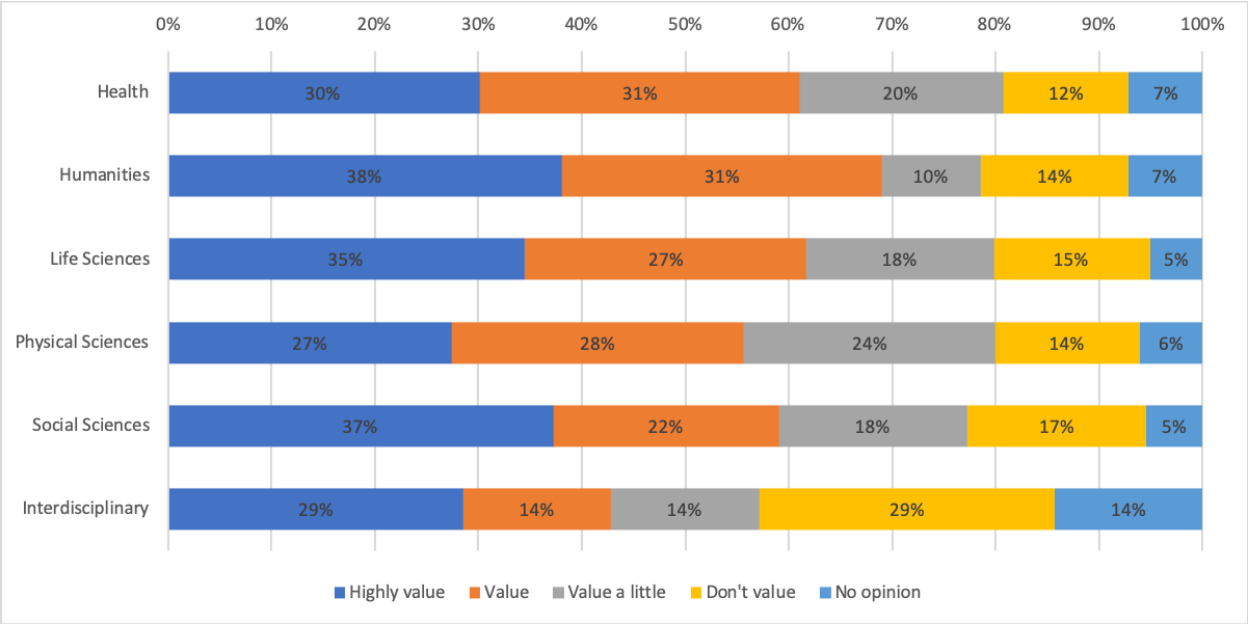


Figure 81: Valuation of the following factor given an increase in the federal budget: Include funding for peripheral support. Respondents were asked to indicate how much they value the above factor if there were an increase in the total federal budget for graduate and postdoctoral awards (n = 239, n = 42, n = 452, n = 430, n = 110, n = 7). Peripheral support may include health/dental benefits, EI/CPP, etc.

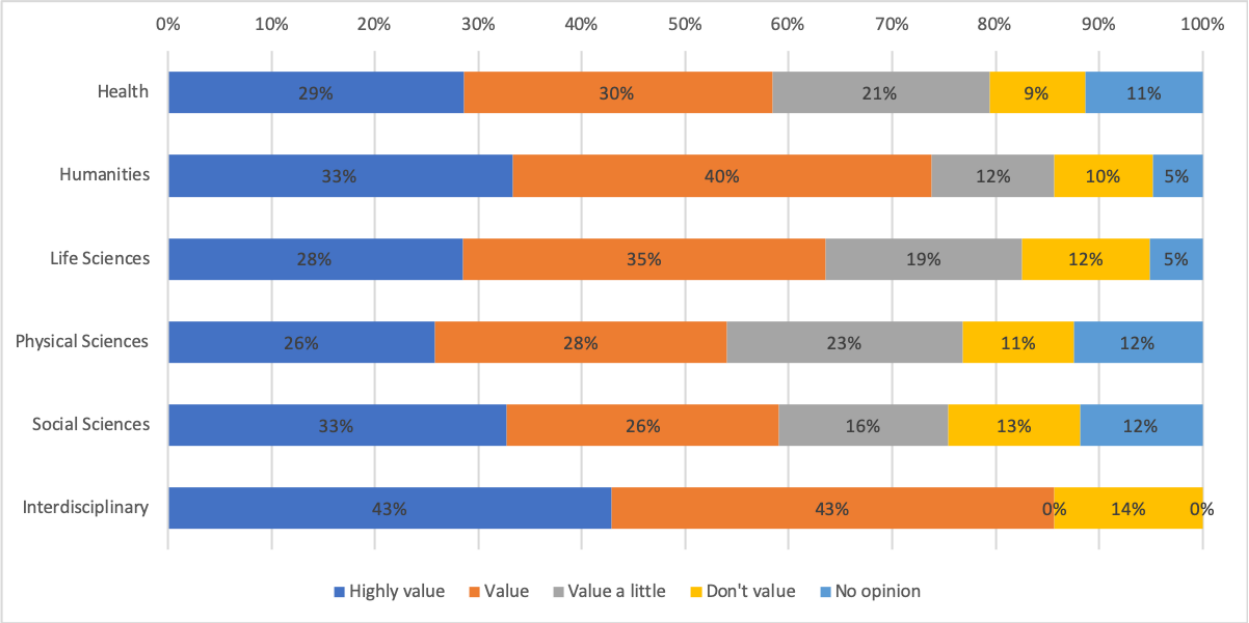


Figure 82: Valuation of the following factor given an increase in the federal budget: More support for awardees with dependents. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 238, n = 42, n = 453, n = 243, n = 110, n = 7).

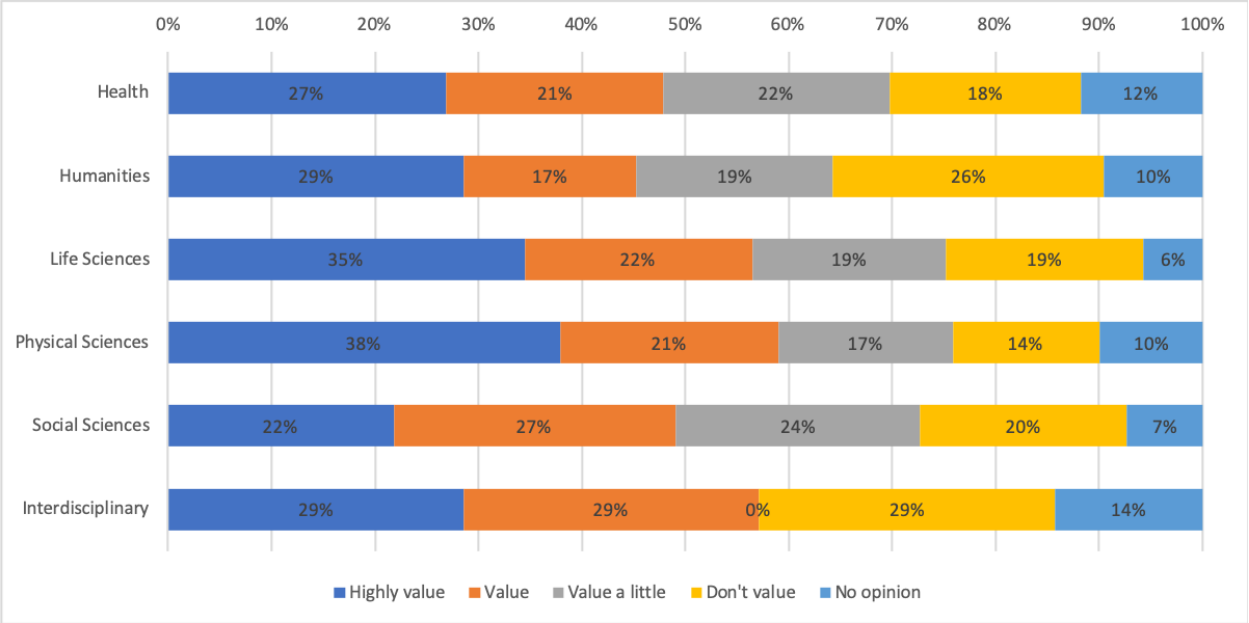


Figure 83: Valuation of the following factor given an increase in the federal budget: Increasing the number of awards open to international applicants. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 238, n = 42, n = 455, n = 232, n = 110, n = 7).

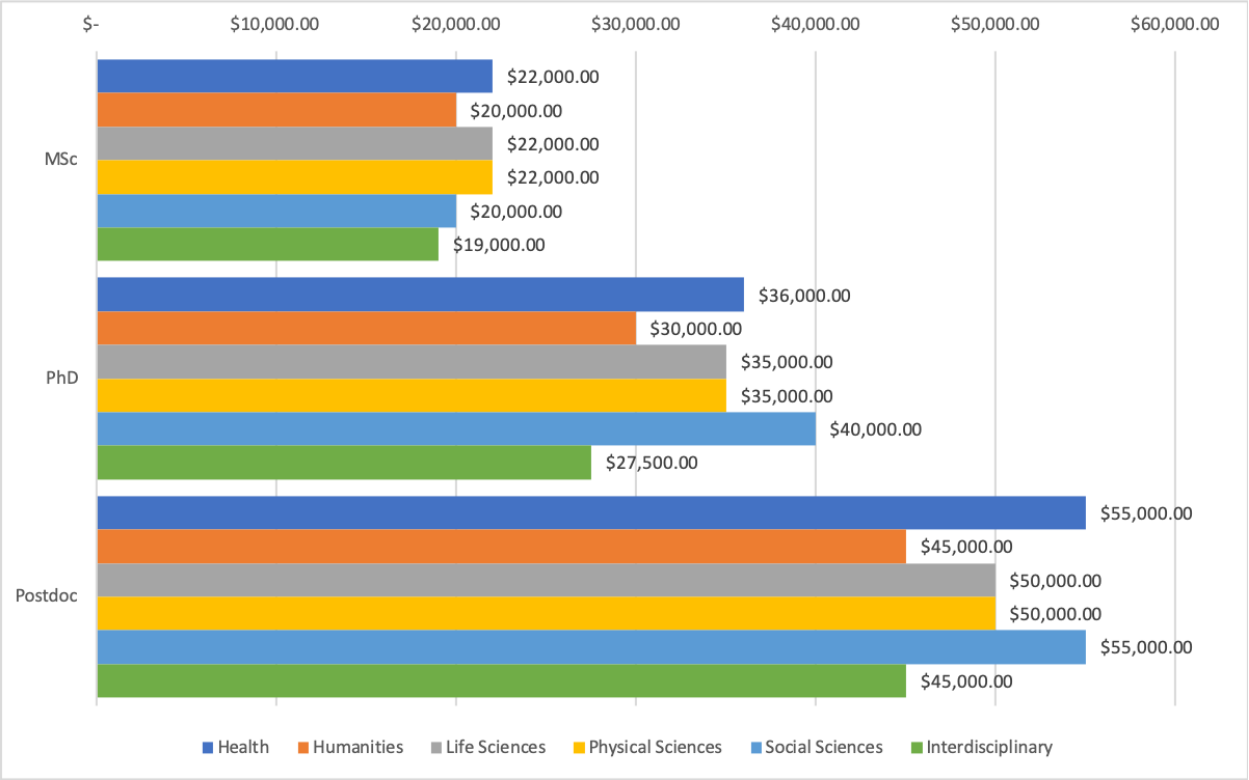


Figure 84: Recommended value of federal awards by level of study. Respondents were asked to generate ideal award values given inflation and the present costs of living in university towns, given there was an increase in the federal budget (n = 144, n = 18, n = 304, n = 120, n = 61, n = 6). Median values are reported.

Conclusions

The funding requirements of young researchers vary widely across traditional disciplines. The three Tri-Council Agency funding programs broadly correspond to the disciplines categorized in our survey: CIHR represents funding for Health; NSERC for Life Sciences, and Physical Sciences, Math and Engineering; SSHRC for Social Sciences and Humanities. Despite the recent harmonization efforts of the CGS-M awards in 2013[4], which strove to eliminate silos and duplication across the Agencies, ECRs continue to perceive support of their research by the Tri-Agencies differentially across fields of study, in particular those researchers from Humanities and Social Sciences. Over half of young researchers in the Humanities, and nearly a third in Social Sciences believe their field is not adequately represented by the current federal awards opportunities.

Additionally, of trainees in Humanities and Social Sciences that successfully received awards, 3 in 4 required other sources of funding during their awards. In comparison, just under two thirds of those in Life, Health or Physical Sciences required supplementary income. This field-driven discrepancy in adequate support may be due to the lower value of SSHRC Doctoral Fellowships and PGS-D awards valued at $20,000 and $21,000 annually, respectively. In fact, three quarters of trainees in the social sciences value harmonization of doctoral award monetary value across the funding agencies.

[4] Canadian Institutes of Health Research: "Evaluation of the Canada Graduate Scholarships (CGS) Program, 2008-2013. Canadian Institutes of Health Research." https://cihr-irsc.gc.ca/e/documents/evaluation_cgs_program_2016-en.pdf

Notably, young researchers that self-identify as Interdisciplinary researchers in our survey feel increasingly underrepresented by the federal awards available; 86% cite inadequate support. The same number of interdisciplinary ECRs, along with one third of those in the Social Sciences, and half of those in Humanities cited lack of support for multidisciplinary projects as a barrier to award application. As young researchers driving innovation are rapidly evolving and expanding their disciplines beyond silos, so too should the awards available to support them. Given these data, we wholly support the ongoing efforts of the Tri-Agency Harmonization Scholarships Liaison Officers Working Group (SLO Working Group) to harmonize the present federal doctoral funding system.

In addition to differences in perceived support, trainee valuation of excellence criteria in awards applications varies widely by field of study. For instance, approximately three quarters of graduate students and postdoctoral fellows in Life Sciences, and Health and half of those in Physical Sciences, Math and Engineering value the inclusion of mentorship activities in reviewer criteria. More than half of all respondents in these three fields also value consideration of international collaboration in the awards review process. This valuation of external collaboration may be attributed to a pattern of decentralization of expertise in natural sciences, health and engineering expertise across the globe.

Contrastingly, over half of respondents in the Humanities and Social Sciences voice their support of considering academic record in awards criteria. This may reflect the heightened importance of course-based learning in these disciplines. Also, the Humanities and Social Sciences have more routes for publishing external to classical journals in comparison to their counterparts in health, life and physical sciences. Thus, more than three quarters of ECRs in these fields value the inclusion of non-academic publications. While many ECRs share views on which scholarly activities merit inclusion into awards, it is important to recognize the diverse activities and learning styles surrounding different research disciplines. Federal grants must award tangible demonstrations of this diverse engagement.

Calls for periphery support and accessory awards also vary across discipline. Given an increase in the federal budget, 7 in 10 graduate students and postdoctoral fellows in social science and interdisciplinary research value creating awards for outreach and community engagement. Approximately two thirds of these ECRs, along with two thirds of those in the humanities also value increasing the number of travel awards available at the federal level. Field research, travel, and interfacing with the communities they study is growingly crucial for these trainees to succeed in their domain; we recommend increasing the number of awards for both travel and scientific outreach.

It is clear that a tailored approach is required by federal granting agencies to ensure ECRs are well-supported across disciplines. Diverse research approaches, measures of excellence and supplementary supports should be considered in establishing equitable awards and application criteria. We commend the efforts of the SLO Working Groups and encourage further harmonization and communication between the Tri-Councils to ensure adequate support is given, particularly without leaving multidisciplinary researchers underserved.

Chapter IV: Gender-Based Perspectives

Introduction

The following data analyses seek to uncover the unique experiences of early career researchers with consideration to their gender. As gender is not binary, the survey gave respondents the option to specify their gender as male, female, non-binary, or other, with the opportunity to describe their gender. For the remainder of the report, we will refer to "male" and "female" with the more appropriate terms "man" and "woman". Gender identity also falls on a larger spectrum than these options, which did not account for all cis or trans gender identities or other possible LGBTQ2SIA+ identities. Future research on federal fellowships should better account for the wider variety of possible identities. We also wish to acknowledge that gender identity is not mutually exclusive of other identities, such as disability status, racial identity, or Indigenous identity, and that these other factors also influence experience.

While non-binary responses only represented approximately 1% of total survey respondents, we still wanted to highlight the specific experiences, opinions and barriers of non-binary students, postdoctoral fellows and researchers with regards to attaining funding in Canada. We thus chose to present these data despite a small sample size. No statistics are presently available from the federal government regarding the amount of the population which identifies as a non-binary gender identity, however the 2019 Census Test includes questions that seek to capture this information[5].

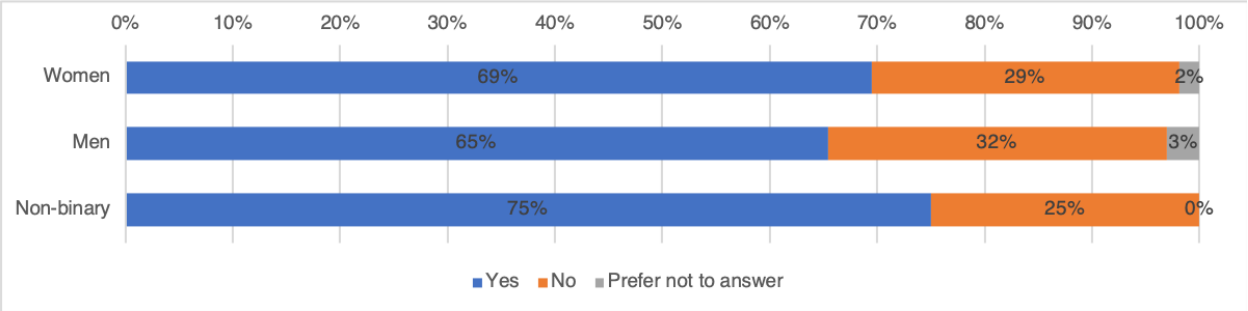
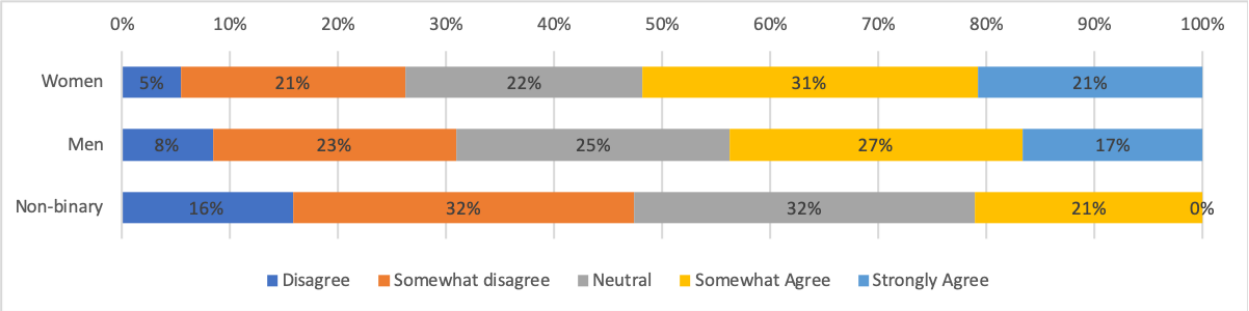


Figure 85: *Have you ever applied for a graduate or postdoctoral fellowship through CIHR, NSERC, or SSHRC?* (n = 629, n = 457, n = 12).



[5] Sex and Gender: consultations for the 2019 Census Test resulted in the inclusion of new and modified questions on sex at birth and gender, to be implemented in the 2021 Census. Statistics Canada. https://www12.statcan.gc.ca/census-recensement/2021/road2021-chemin2021/fs-fi/sex-and-gender.cfm

Figure 86: *Please state to what degree you agree with the following statement: I received adequate resources to help me complete my application.* Respondents who applied for a federal grant were asked to state their agreeance with the above statement (n = 438, n = 299, n = 9). (figure on previous page)

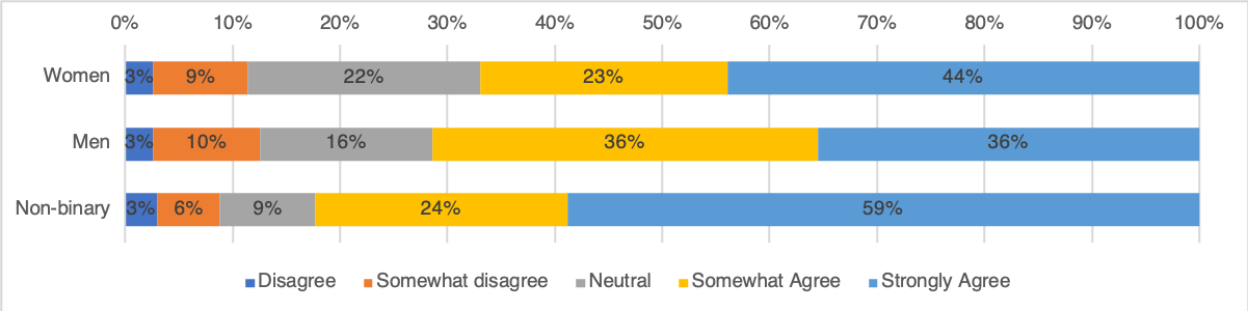


Figure 87: *Please state to what degree you agree with the following statement: I received useful feedback from my application, whether or not it was successful?* Respondents who applied for a federal grant were asked to state their agreeance with the above statement (n = 438, n = 299, n = 9).

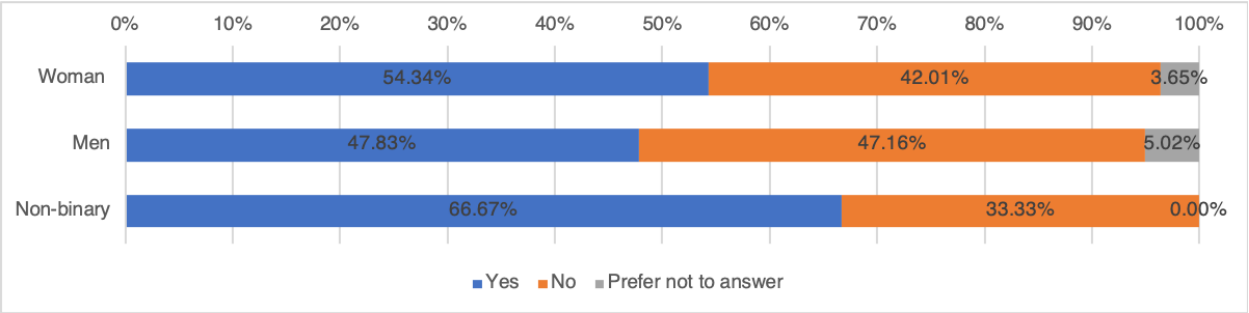


Figure 88: *Were any of your application(s) successful?* Respondents who applied for a federal grant were asked to state if their application was successful (n = 438, n = 299, n = 9).

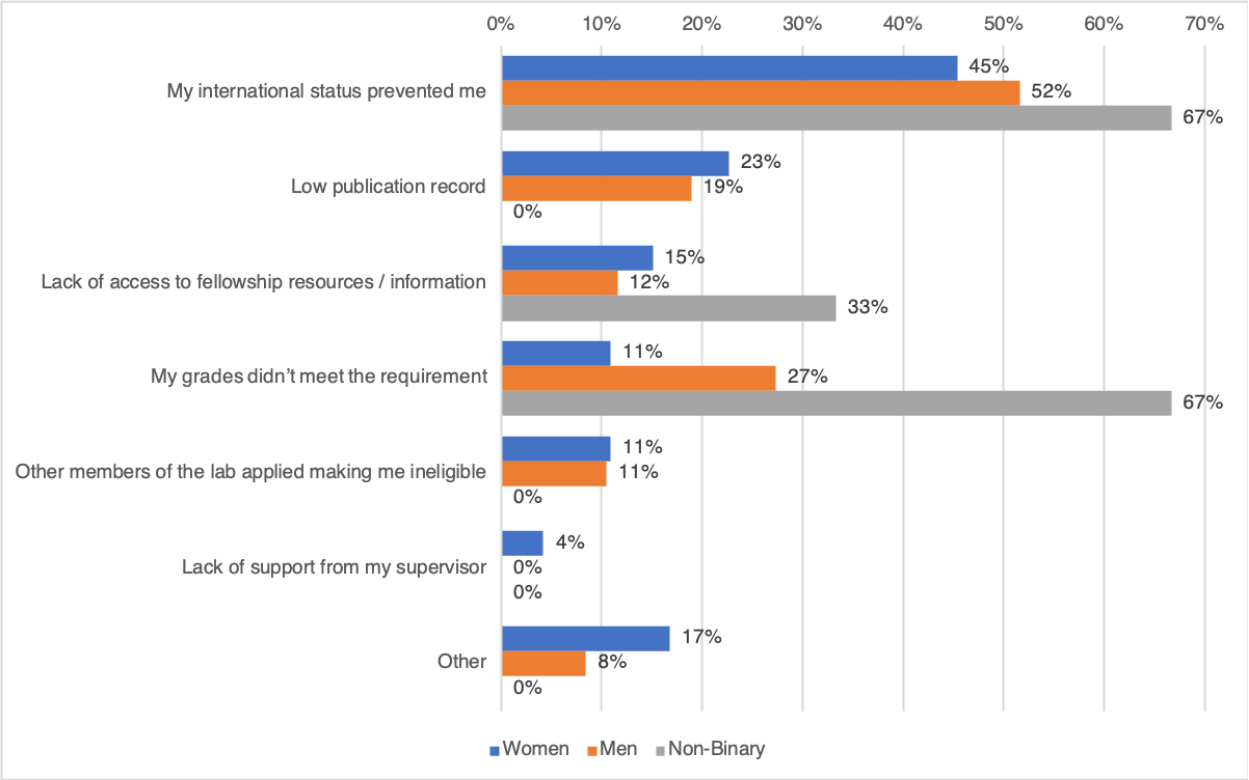


Figure 89: *What prevented you from applying?* Respondents were asked to indicate the reason that prevented them from applying for fellowships/scholarships. (n = 119, n = 95, n = 3).

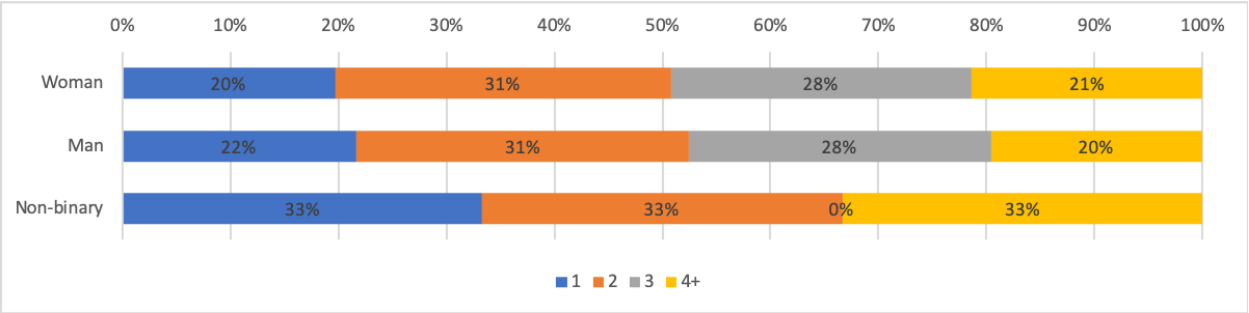


Figure 90: *How many federal fellowships/studentships have you applied for?* Successful awardees disclosed the number of federal grants to which they applied. (n = 238, n = 143, n = 6).

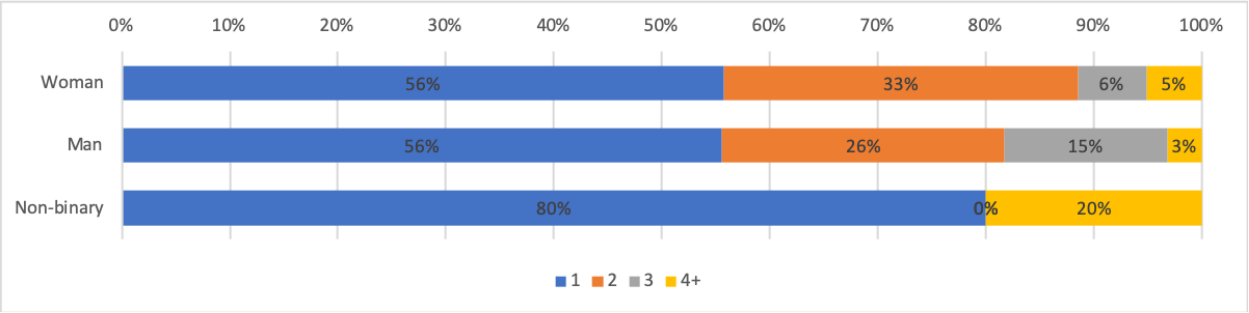


Figure 91: *How many of your federal fellowship/studentship applications have been successful?* Successful awardees disclosed the number of federal grants they received. (n = 235, n = 126, n = 5). (figure on previous page)

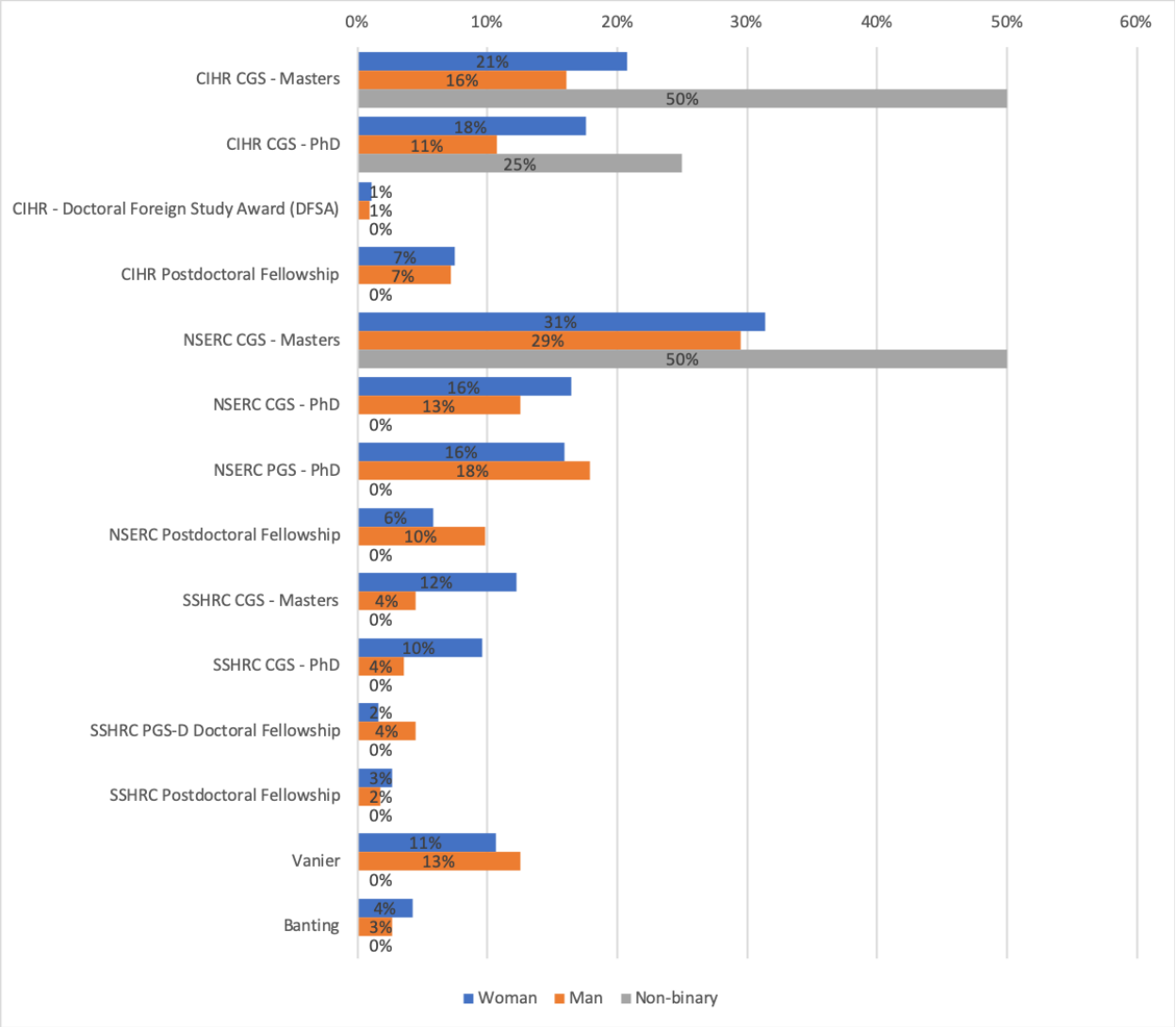


Figure 92: *Federal awards received.* Respondents noted which awards they successfully received, with more than one award per applicant possible (n = 188, n = 112, n = 4).

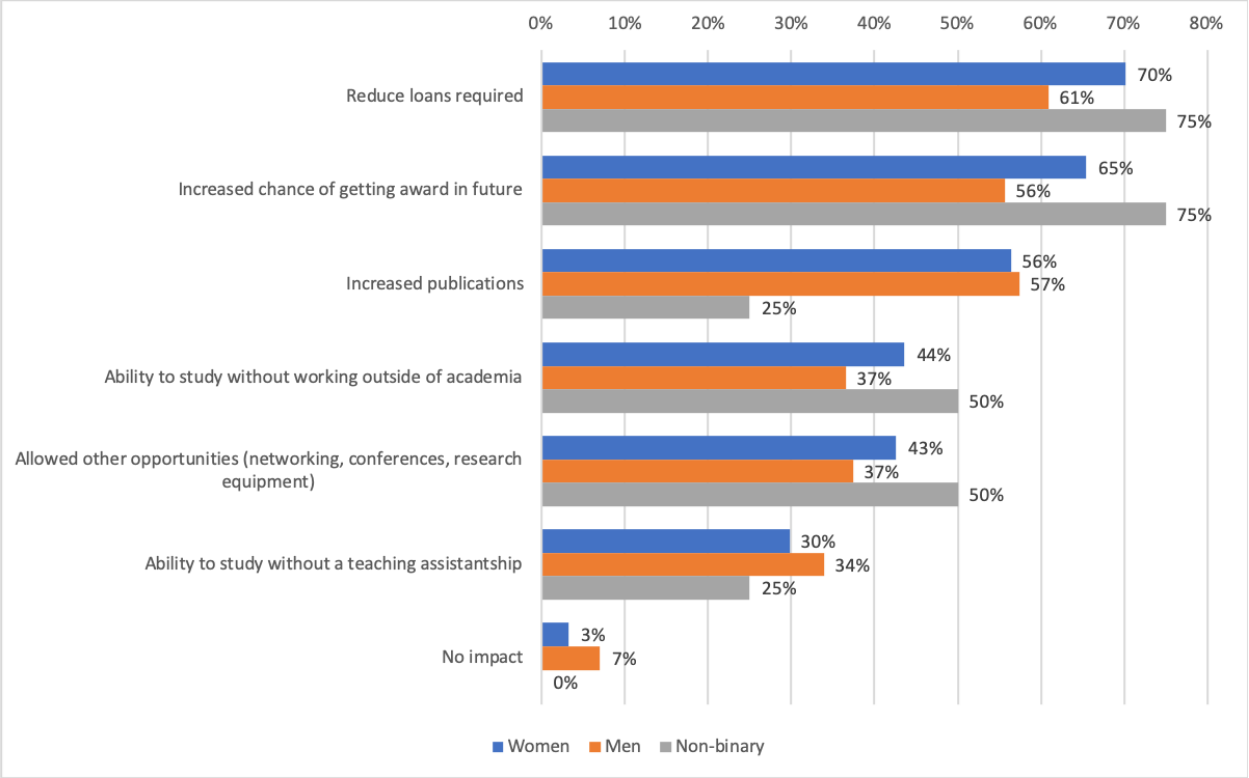


Figure 93: *What impact did receiving an award have on you and your research?* Benefits of receiving an award on successful awardees, by percent (n = 188, n = 115, n = 4).

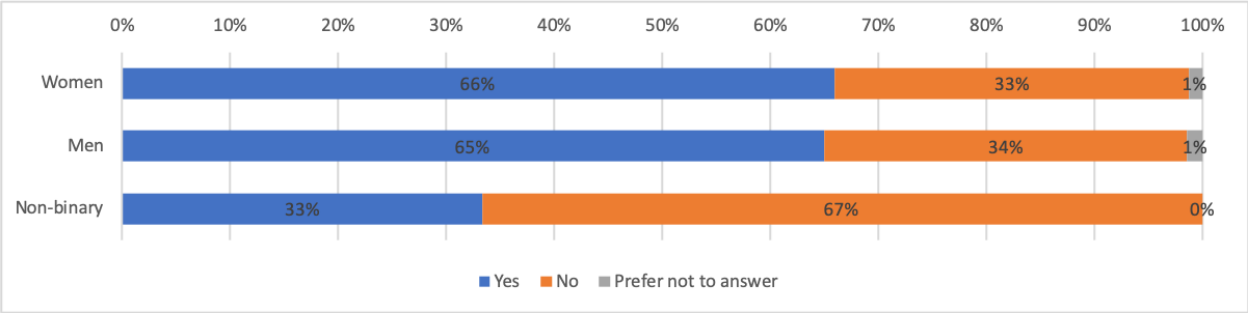


Figure 94: *Did you require other sources of funding during the duration of this award?* Percent of respondents who required other sources of funding while holding their award (n = 238, n = 143, n = 6).

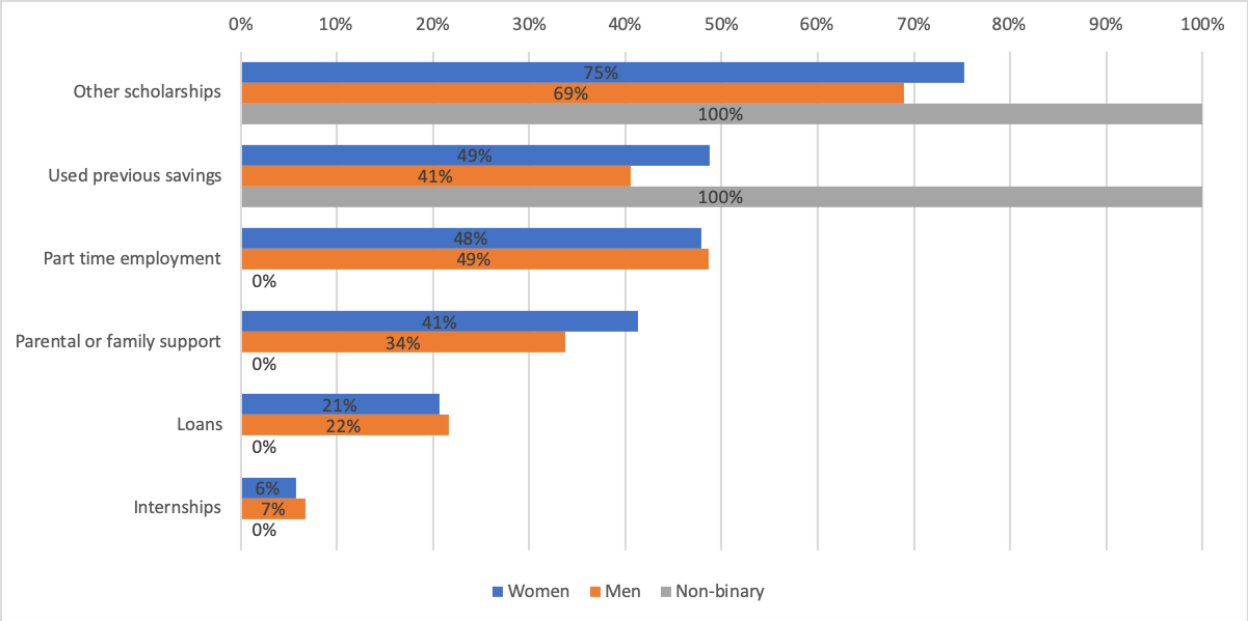


Figure 95: *For those who required other sources of funding during the duration of this award, what type of support did you seek/receive?* Respondents who answered in the affirmative for the above question noted the alternative support they received in addition to their award (n = 188, n = 114, n = 4).

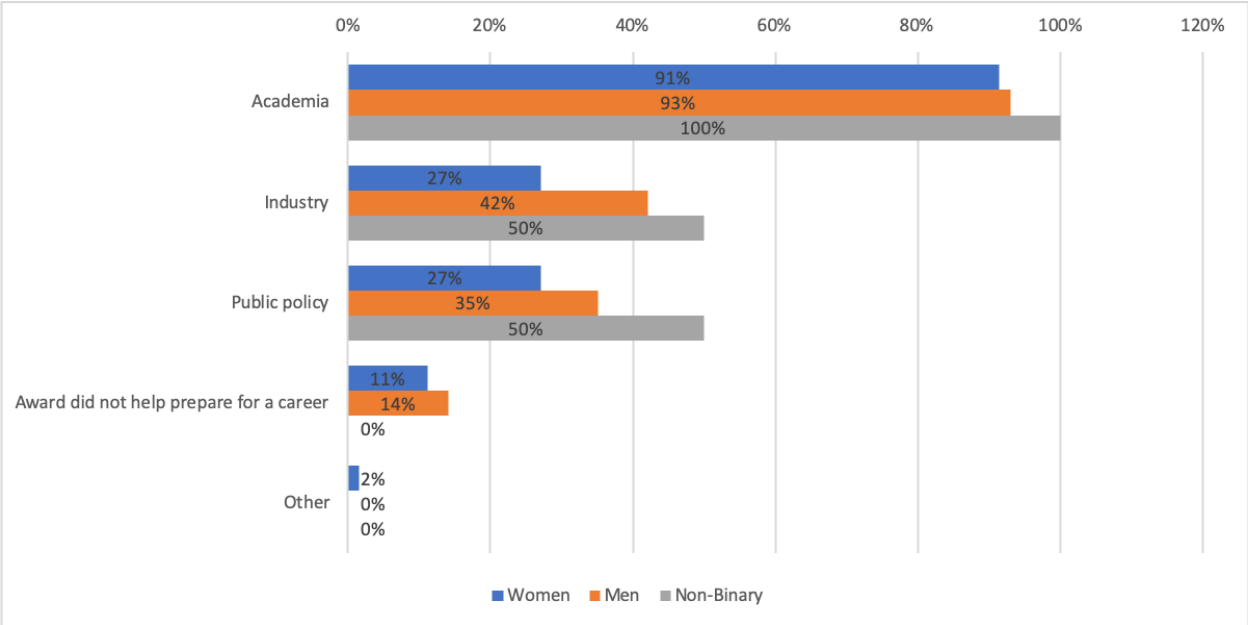


Figure 96: Assistance of federal awards towards diverse career preparation, by number of respondents. Trainees were asked to specify which career paths and industries their award helped them prepare for. Multiple answers possible. Vast majority of respondents indicated that their award prepared them best for a career in academia (n = 188, n = 114, n = 6).

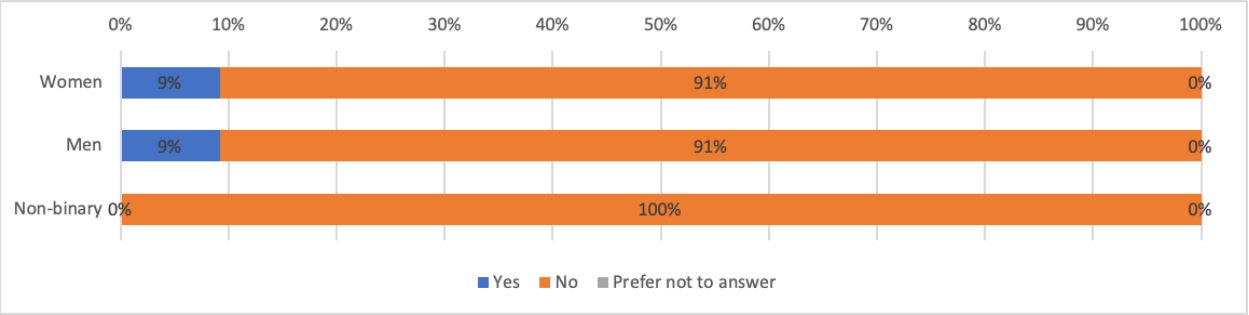


Figure 97: *Did receiving an award have a negative effect on your career or experience?* (n = 238, n = 141, n = 6)

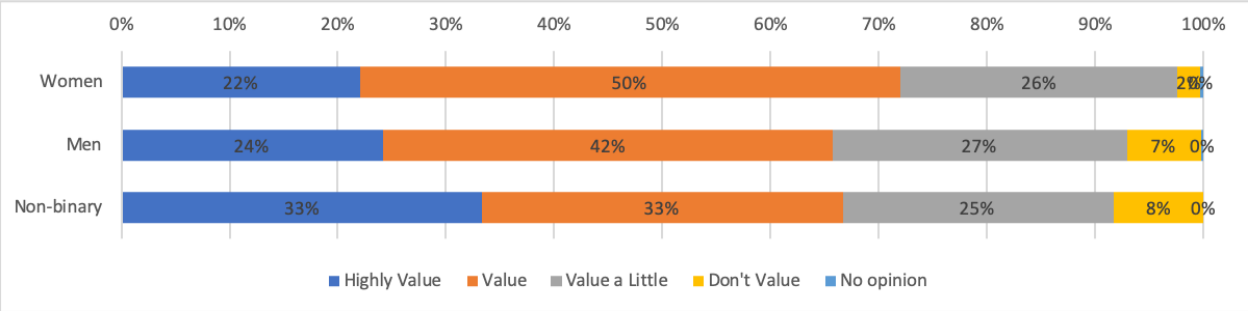


Figure 98: Ideal valuation of fellowship application criteria by reviewers: Academic record. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 622, n = 455, n = 12).

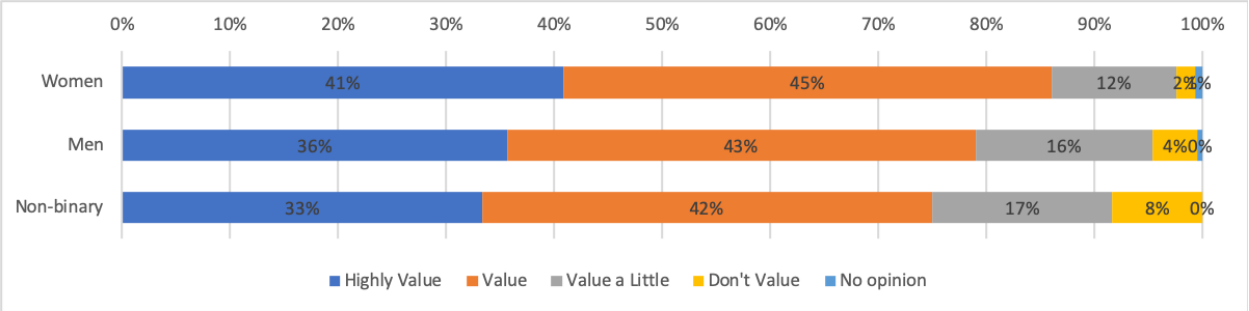


Figure 99: Ideal valuation of fellowship application criteria by reviewers: Research-related extracurricular involvement. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 629, n = 457, n = 12).

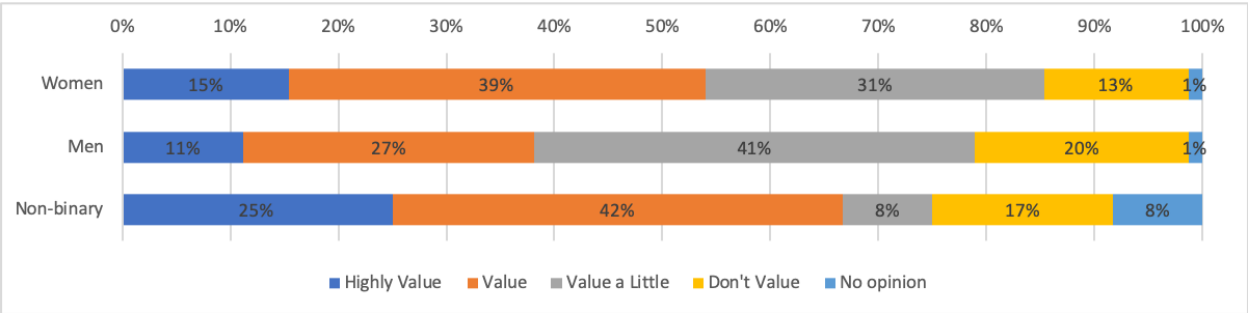


Figure 100: Ideal valuation of fellowship application criteria by reviewers: All other types of extracurricular involvement. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 628, n = 456, n = 12). (figure on previous page)

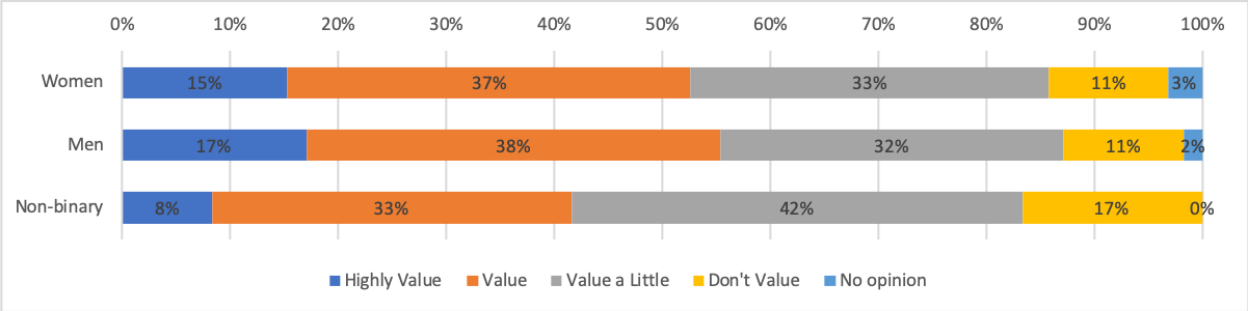


Figure 101: Ideal valuation of fellowship application criteria by reviewers: International collaboration. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 627, n = 457, n = 12).

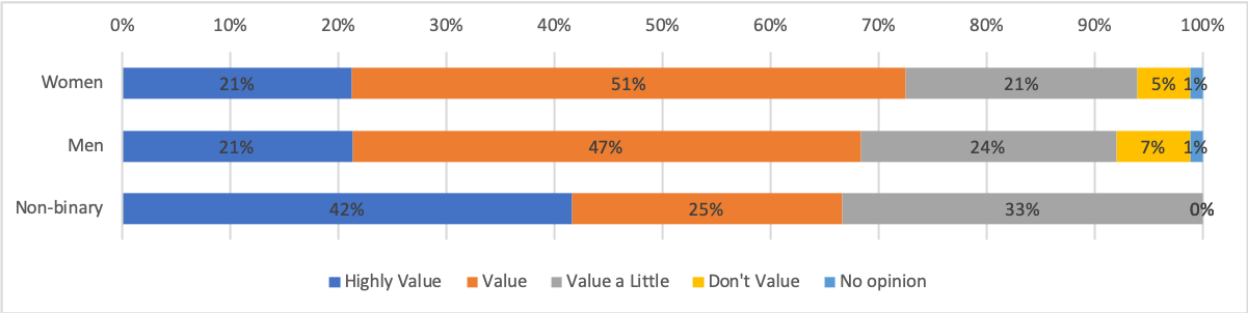


Figure 102: Ideal valuation of fellowship application criteria by reviewers: Mentorship activities. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 626, n = 455, n = 12).

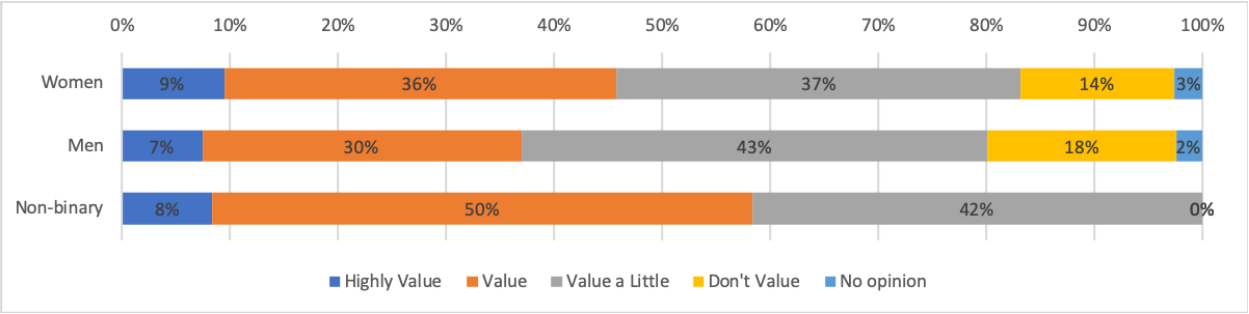


Figure 103: Ideal valuation of fellowship application criteria by reviewers: Non-academic publications. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 625, n = 457, n = 12). Non-academic publications may include books, op-eds, blogs, and white papers.

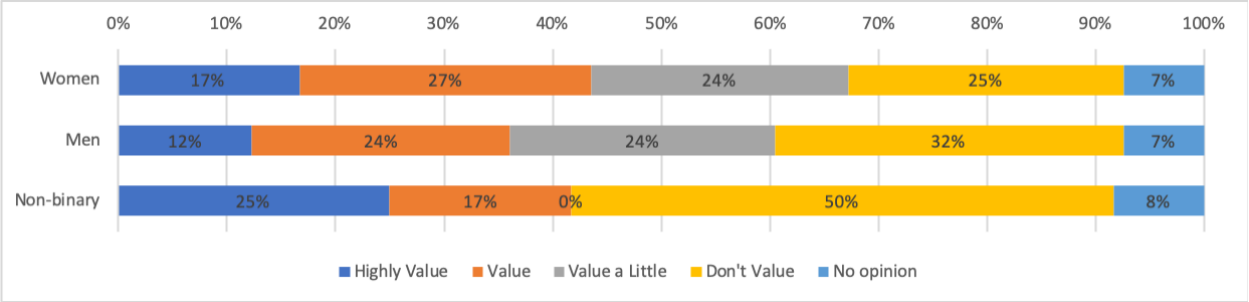


Figure 104: Ideal valuation of fellowship application criteria by reviewers: Periods of leave. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 629, n = 455, n = 12). Periods of leave include those for academic, parental, personal health, familial health, or other reasons.

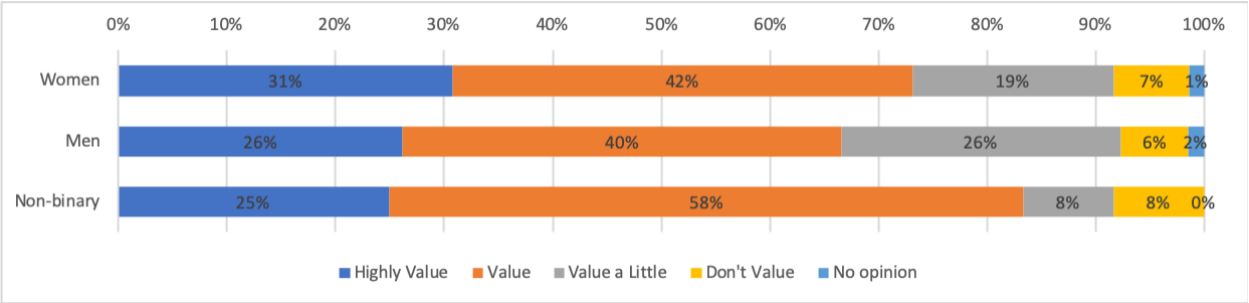


Figure 105: Ideal valuation of fellowship application criteria by reviewers: Potential societal impacts of the research. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 629, n = 455, n = 12).

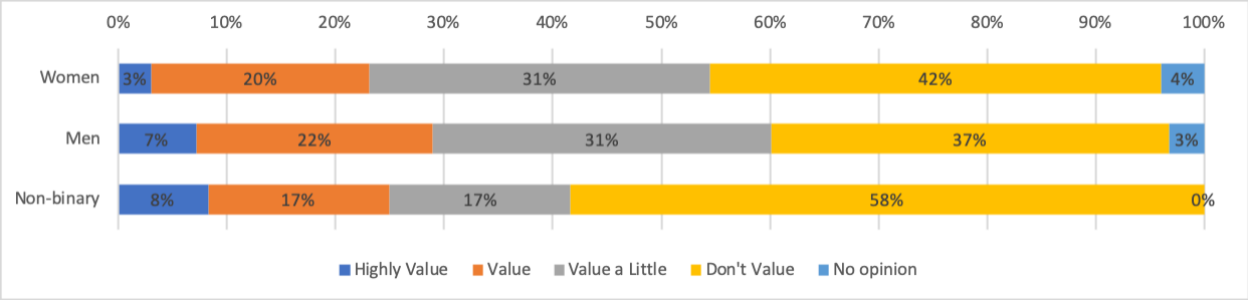


Figure 106: Ideal valuation of fellowship application criteria by reviewers: Prestige of the institution or of your supervisor. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 626, n = 456, n = 12).

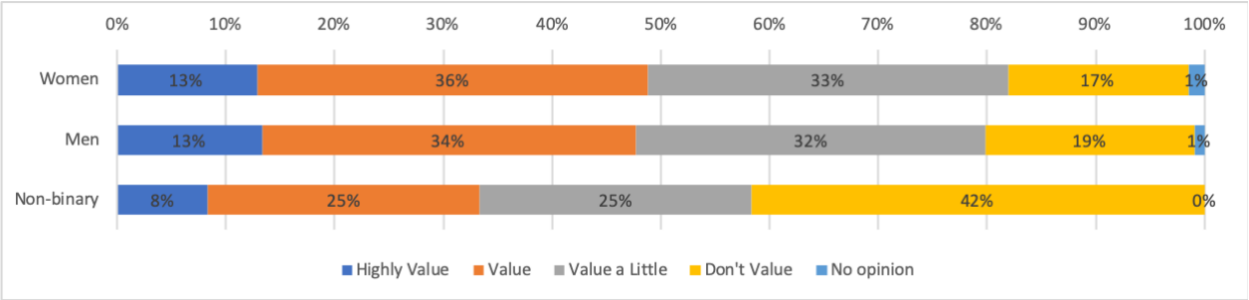


Figure 107: Ideal valuation of fellowship application criteria by reviewers: Previous success with awards (distinctions). Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 621, n = 457, n = 12). (figure on previous page)

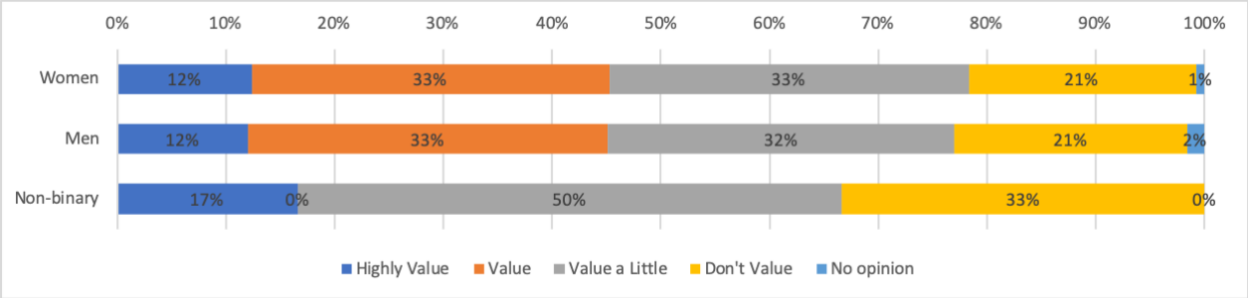


Figure 108: Ideal valuation of fellowship application criteria by reviewers: Previous success with scholarships and fellowships. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 629, n = 457, n = 121).

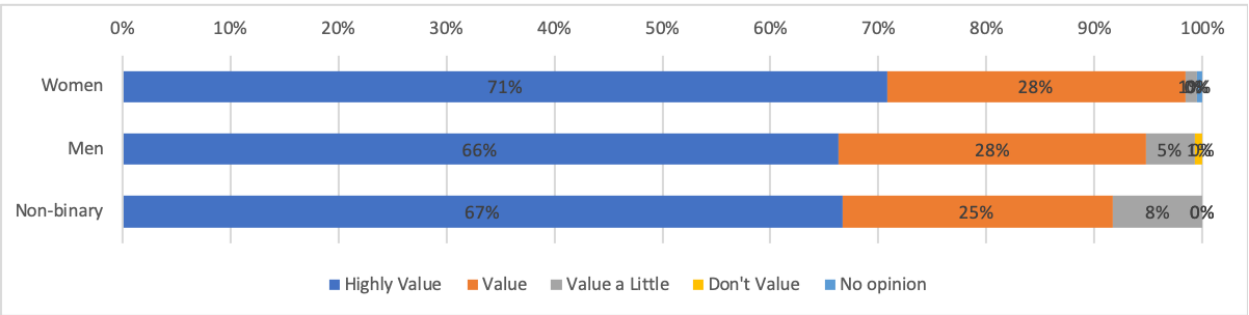


Figure 109: Ideal valuation of fellowship application criteria by reviewers: Project description / proposal. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 628, n = 457, n = 12).

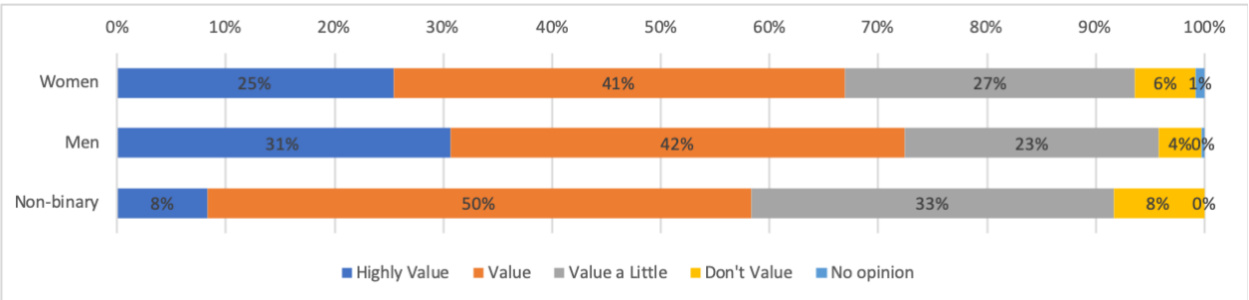


Figure 110: Ideal valuation of fellowship application criteria by reviewers: Publication record. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 629, n = 457, n = 12). (figure on previous page)

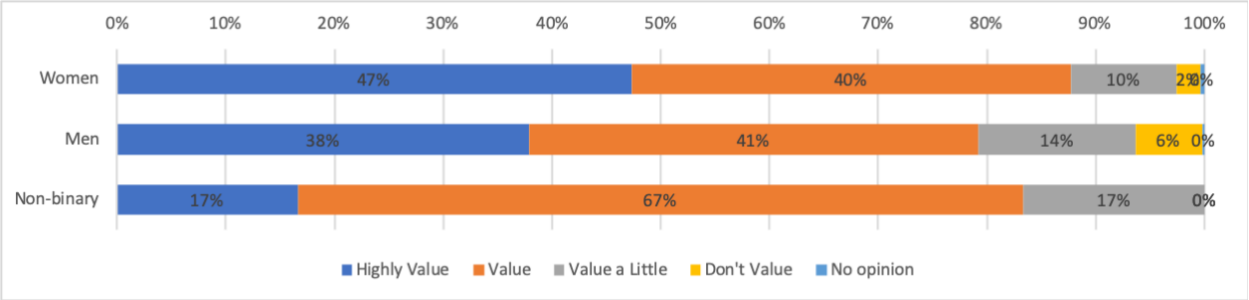


Figure 111: Ideal valuation of fellowship application criteria by reviewers: Reference letters. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 457, n = 628, n = 12).

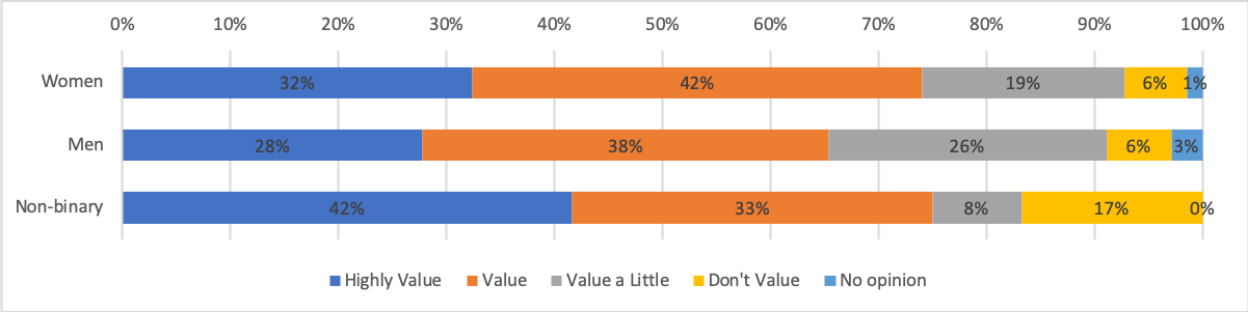


Figure 112: Ideal valuation of fellowship application criteria by reviewers: Societal importance of the challenge the research seeks to address. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 629, n = 459, n = 12).

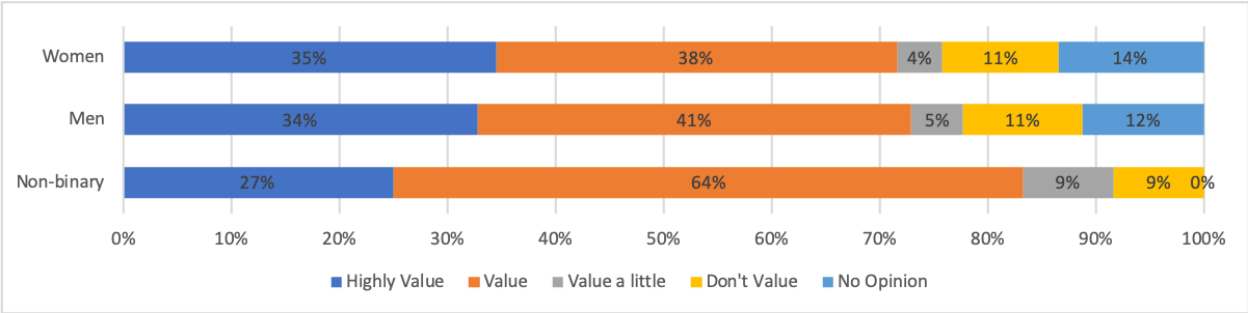


Figure 113: Ideal valuation of fellowship application criteria by reviewers: Teaching / TAship. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 628, n = 454, n = 12).

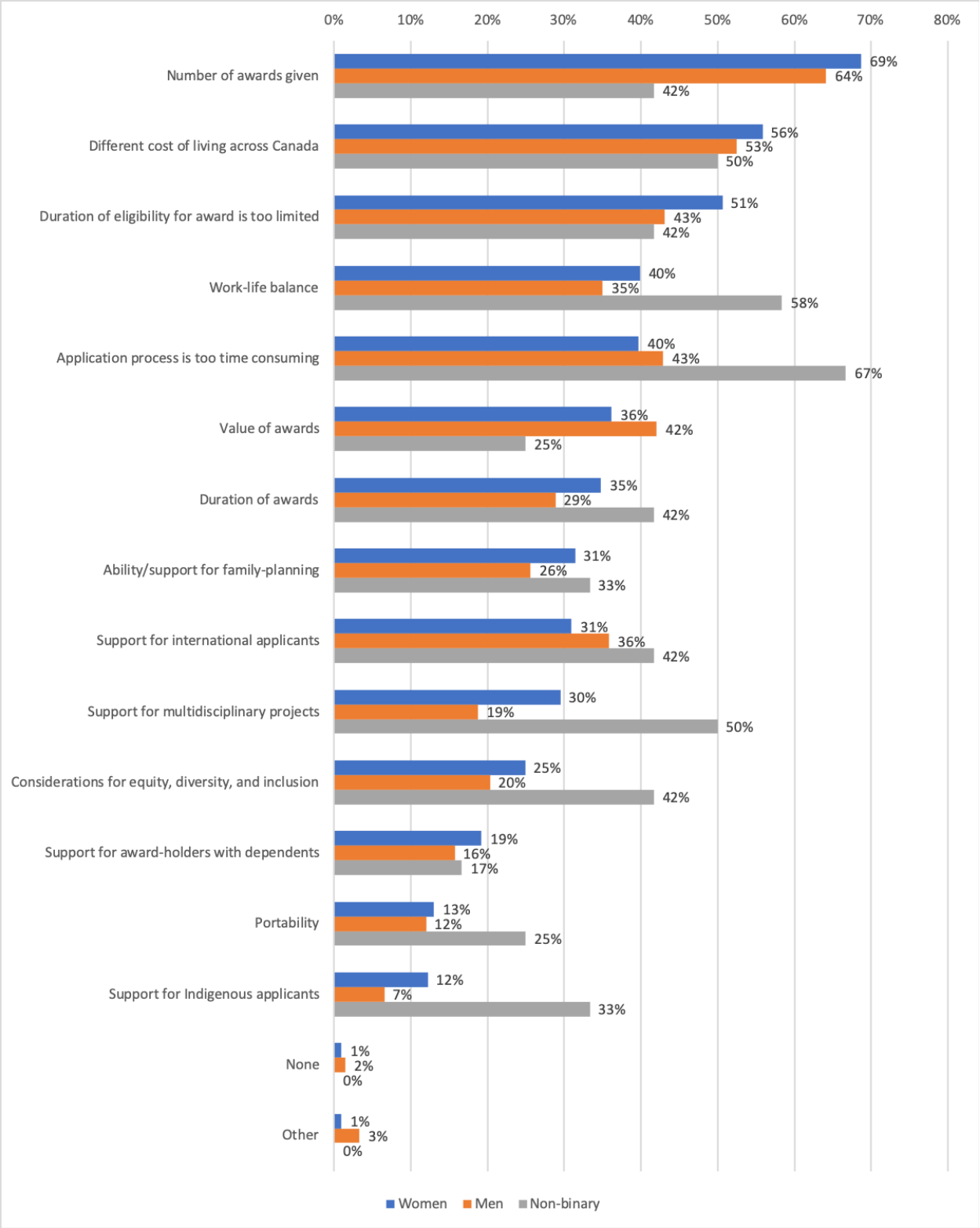


Figure 114: Barriers and problems for award opportunities, by percent. Respondents were asked to identify barriers they perceived or faced when applying to federal scholarships and fellowships (n = 630, n = 457, n = 12). Multiple selections possible.

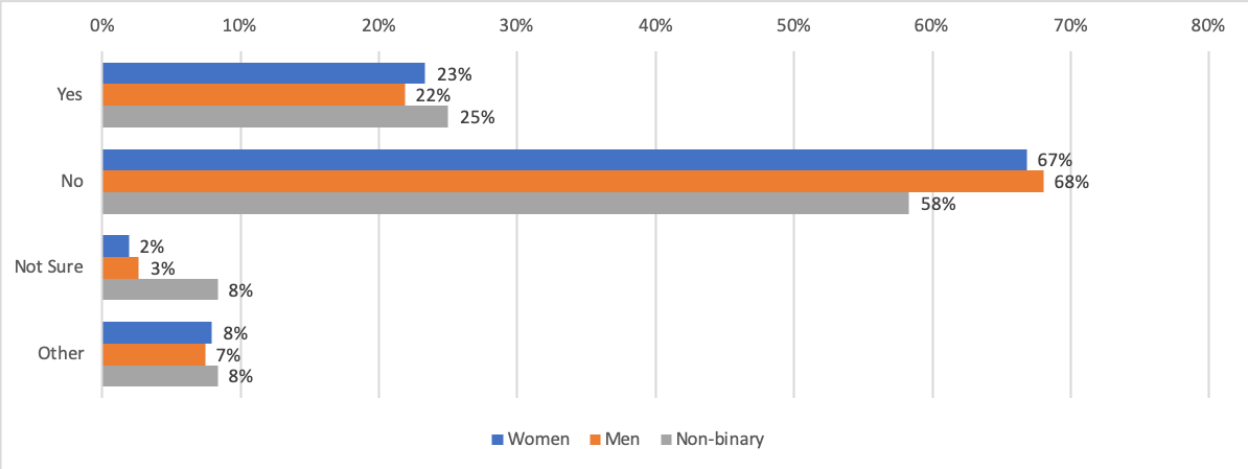


Figure 114: *Do you think your field of research is not adequately represented by the awards opportunities available from CIHR, NSERC, or SSHRC?* By percent (n = 630, n = 457, n = 12).

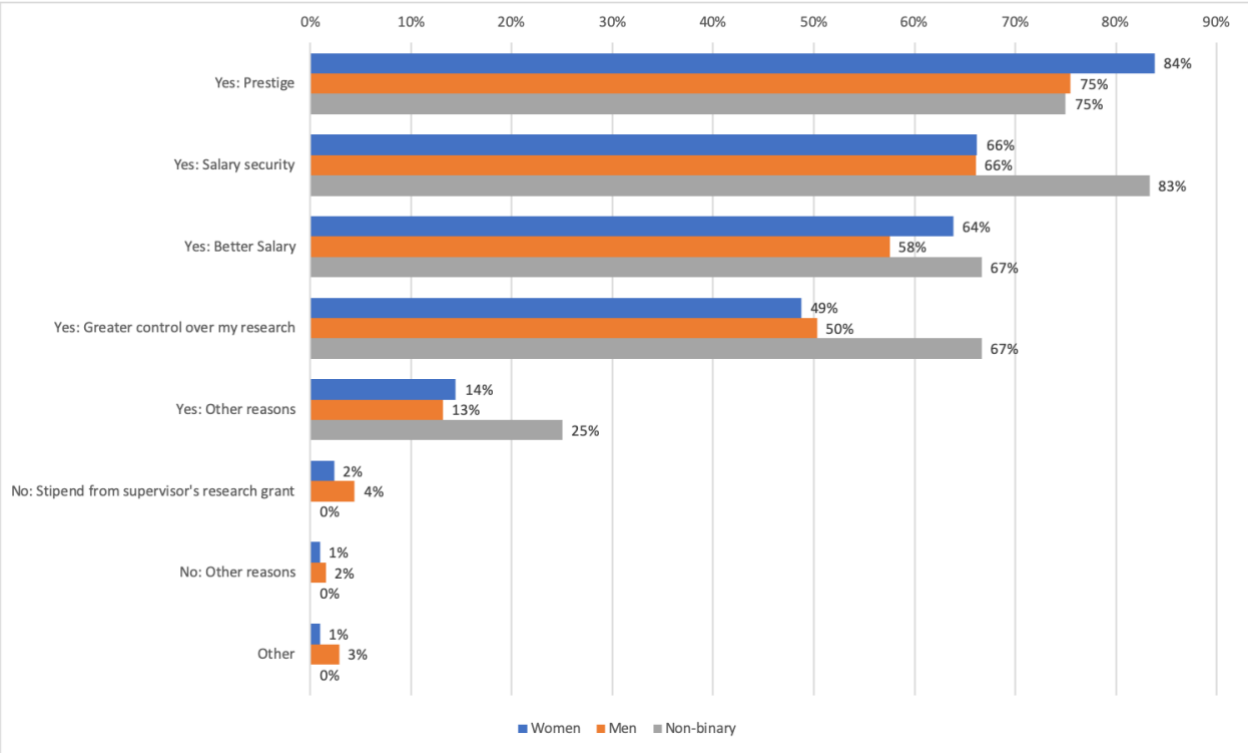


Figure 115: Benefits of obtaining funding from awards, rather than from supervisor's research grant, by percent (n = 630, n = 457, n = 12). Multiple selections possible. Women perceive greater benefits regarding prestige, and non-binary respondents from salary and control from their awards than male respondents.

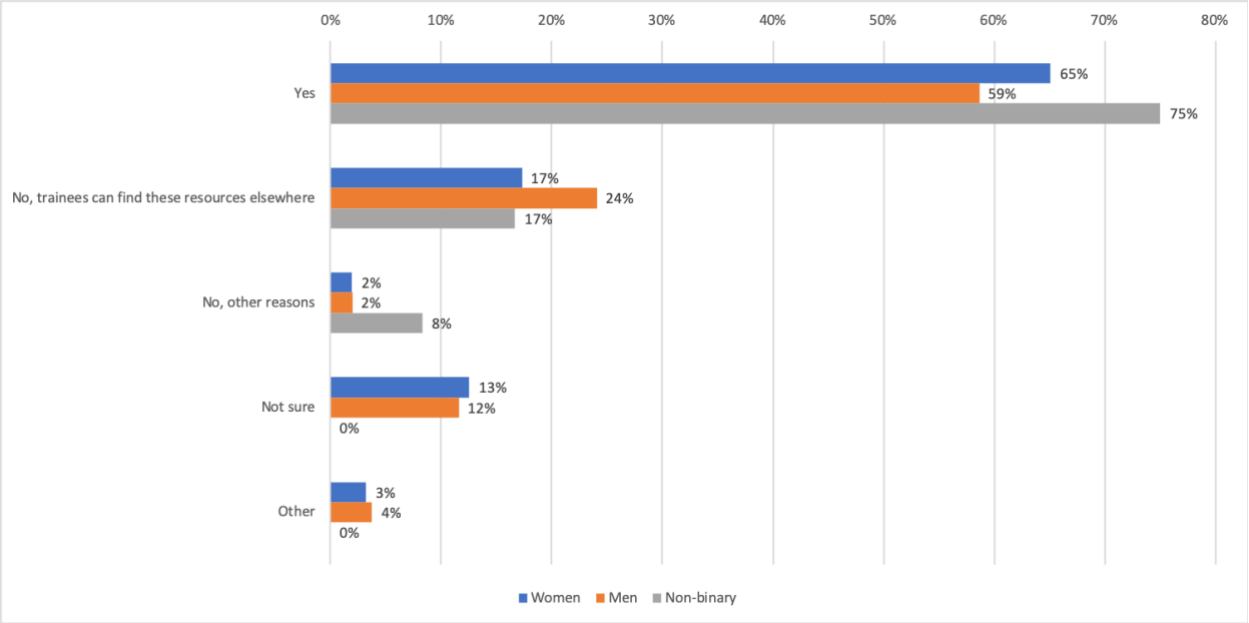


Figure 116: *Do you think that scholarships and fellowships should help to prepare trainees for diverse careers outside of academia?* By percent (n = 630, n = 457, n = 12).

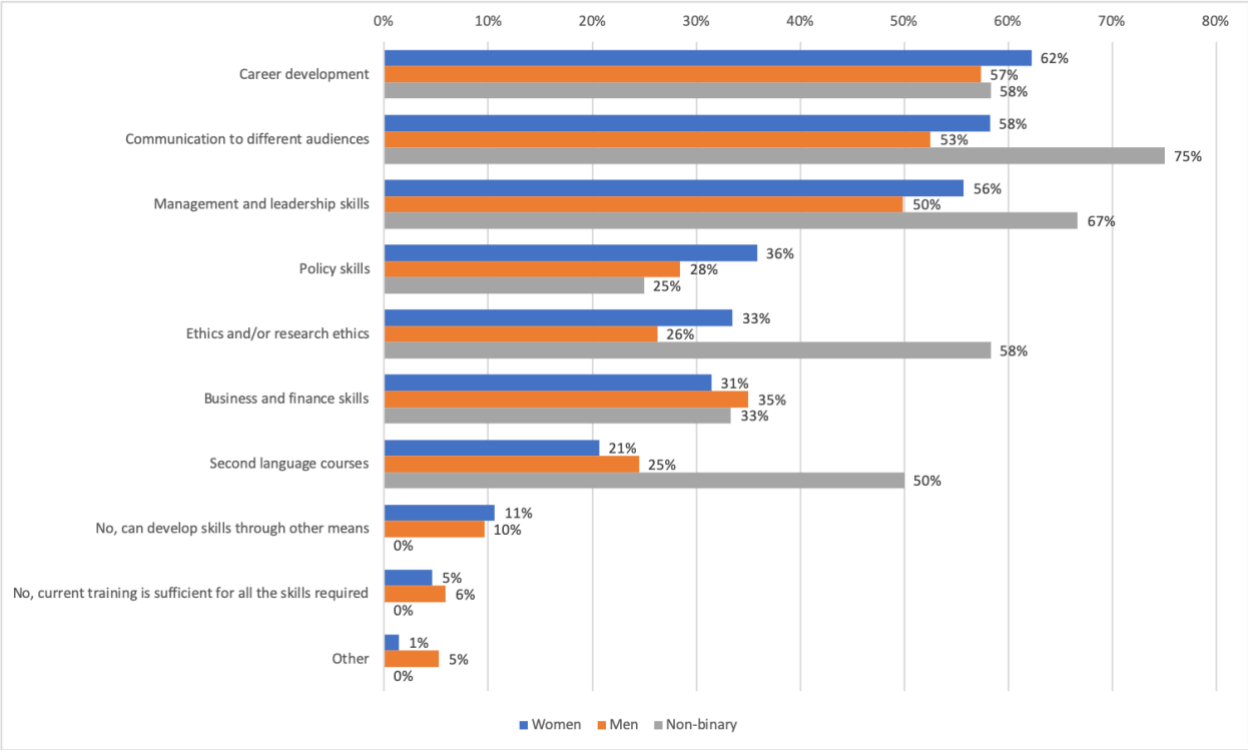


Figure 117: Skills desired to be incorporated into academic training, by percent. Multiple responses possible (n = 630, n = 457, n = 12).

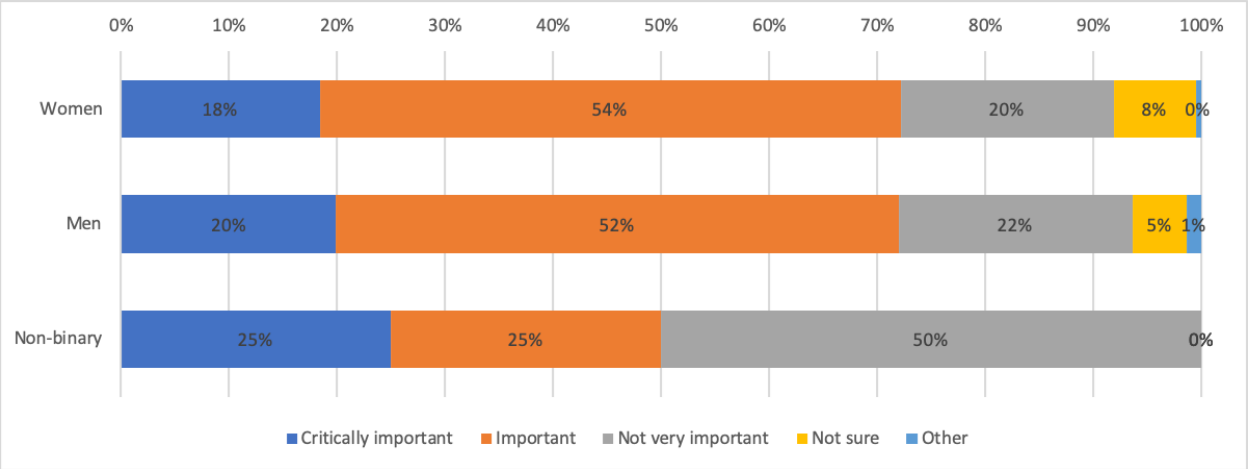


Figure 118: Importance of elite awards, by percent. Respondents were asked to evaluate the importance of the elite Vanier doctoral and Banting postdoctoral awards (n = 630, n = 457, n = 12).

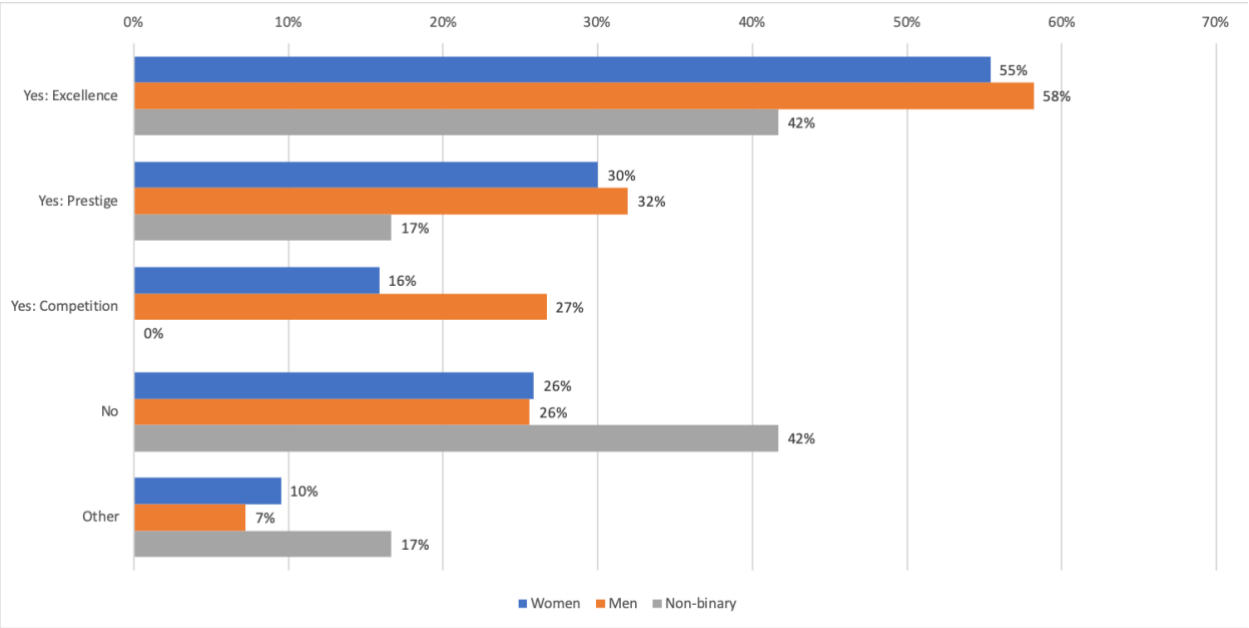


Figure 119: *Are elite awards a beneficial part of the current funding system?* Multiple selections possible (n = 630, n = 457, n = 12).

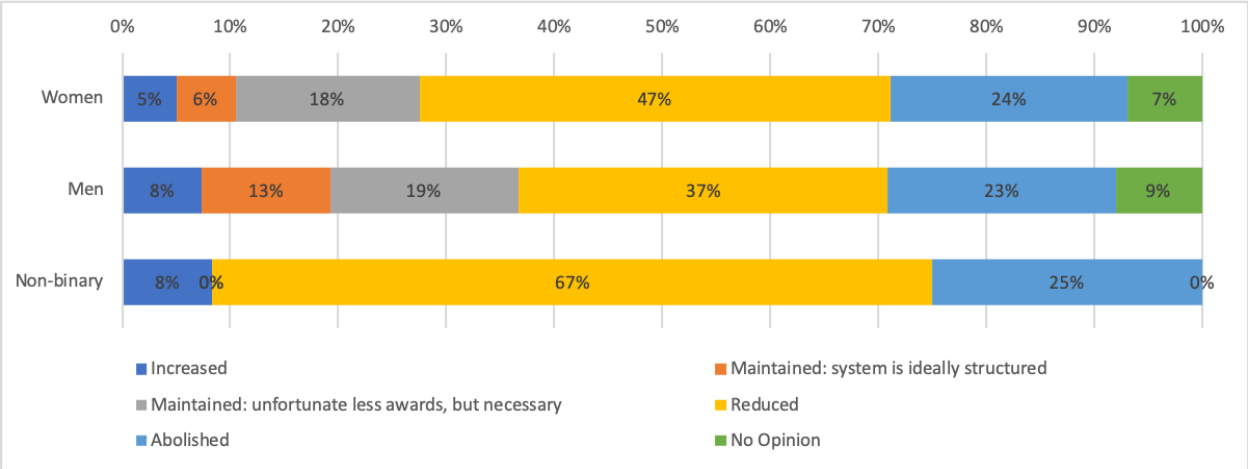


Figure 120: Recommendations for the elite awards system, by percent. Elite awards provide greater levels of support and prestige for select trainees, but the investment required reduces the total number of potential awards available. In considering this, applicants were asked to state their opinion of the current elite awards system (n = 567, n = 401, n = 12).

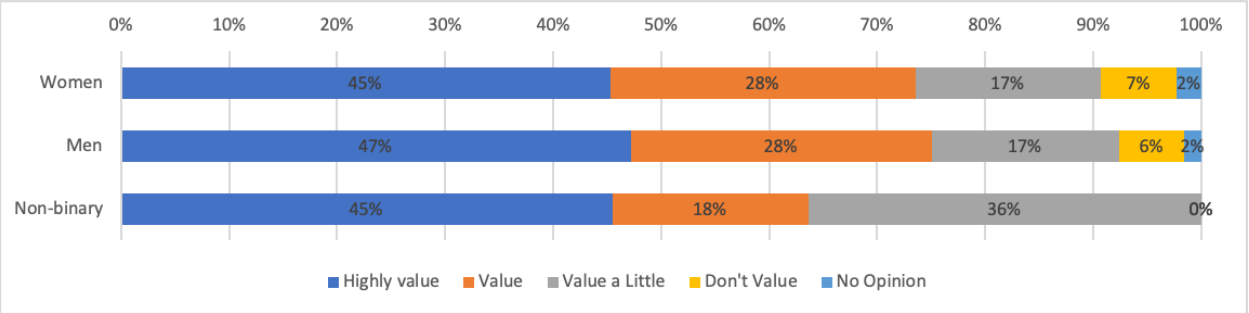


Figure 121: Valuation of the following factor given an increase in the federal budget: Increasing value of all scholarships and fellowships. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 620, n = 445, n = 12).

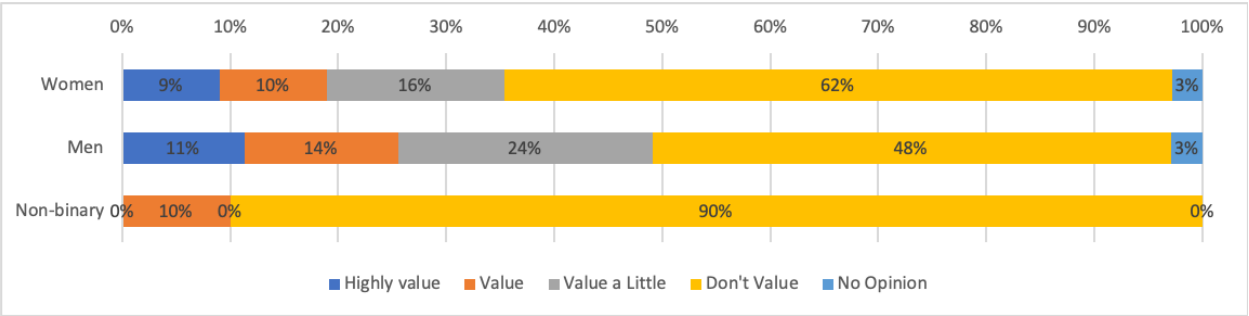


Figure 122: Valuation of the following factor given an increase in the federal budget: Increasing value of elite awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 608, n = 442, n = 12).

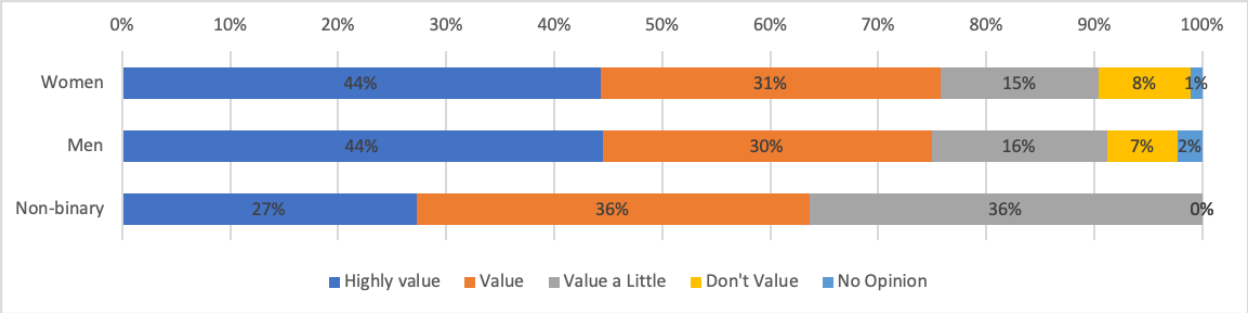


Figure 123: Valuation of the following factor given an increase in the federal budget: Increasing value of standard awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 616, n = 443, n = 11).

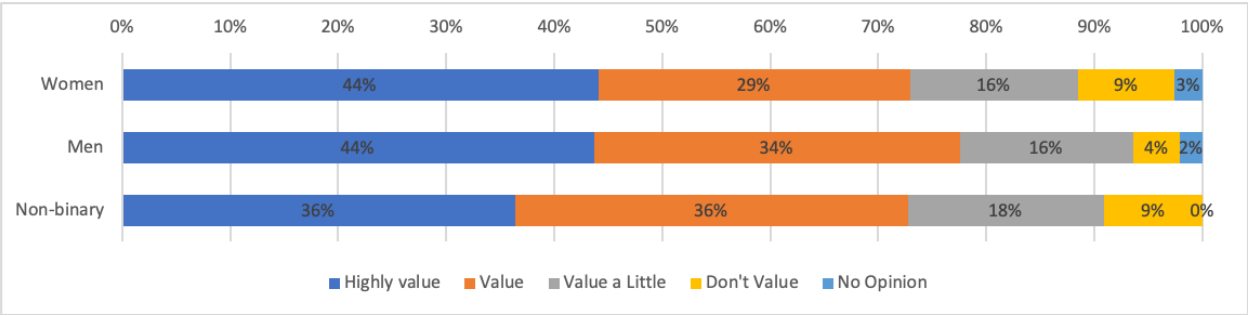


Figure 124: Valuation of the following factor given an increase in the federal budget: Increasing value of all graduate student awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 616, n = 437, n = 11).

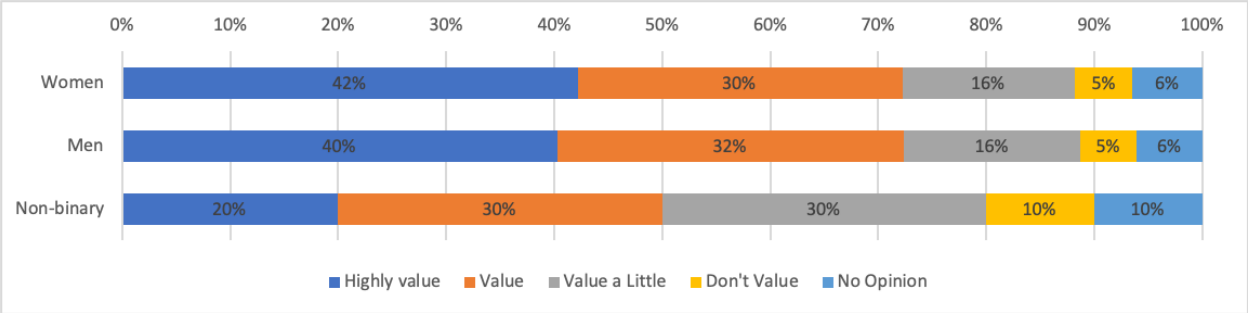


Figure 125: Valuation of the following factor given an increase in the federal budget: Increasing value of postdoctoral awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 619, n = 442, n = 10).

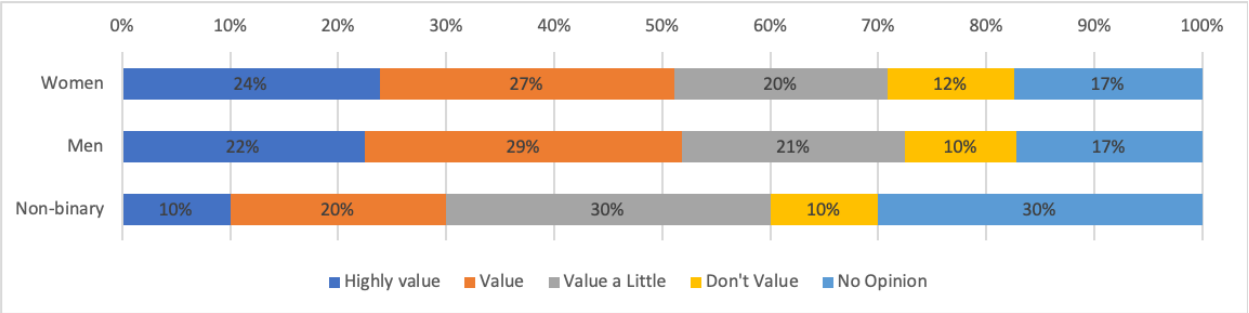


Figure 126: Valuation of the following factor given an increase in the federal budget: Increasing the value of specifically PGS-D Awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 607, n = 436, n = 10). (figure on previous page)

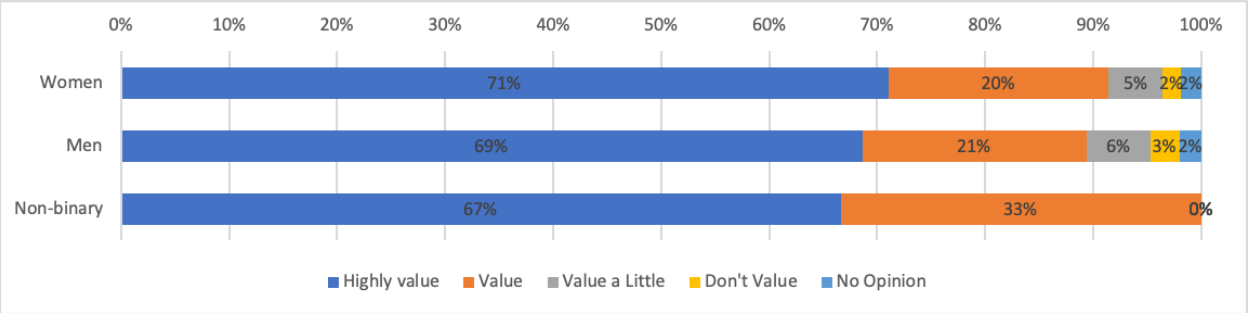


Figure 127: Valuation of the following factor given an increase in the federal budget: Increasing the total number of fellowships given. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 619, n = 443, n = 12).

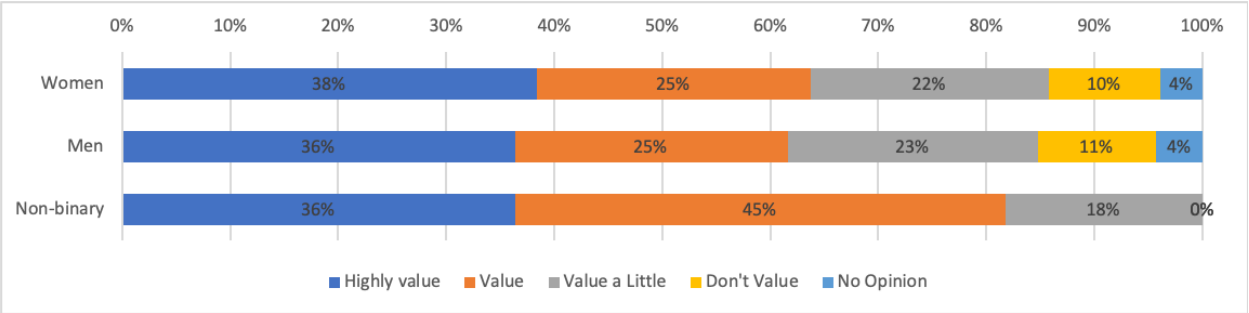


Figure 128: Valuation of the following factor given an increase in the federal budget: Increasing length of awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 618, n = 440, n = 11).

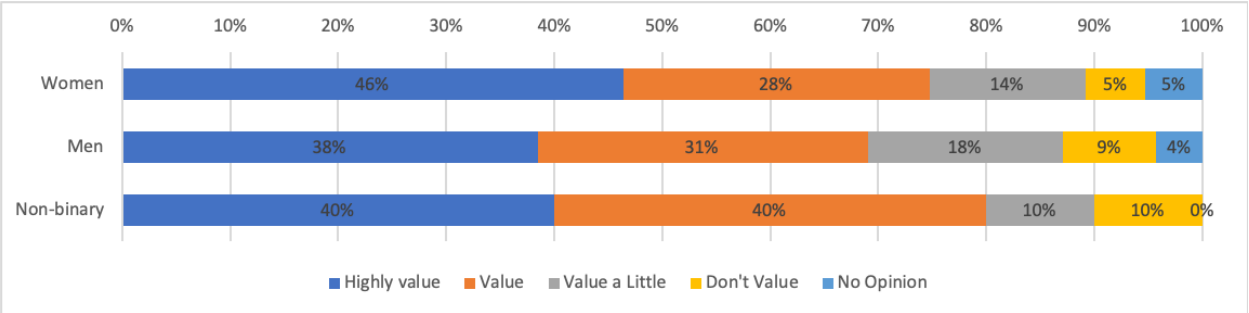


Figure 129: Valuation of the following factor given an increase in the federal budget: Increasing eligibility time of awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 619, n = 442, n = 10).

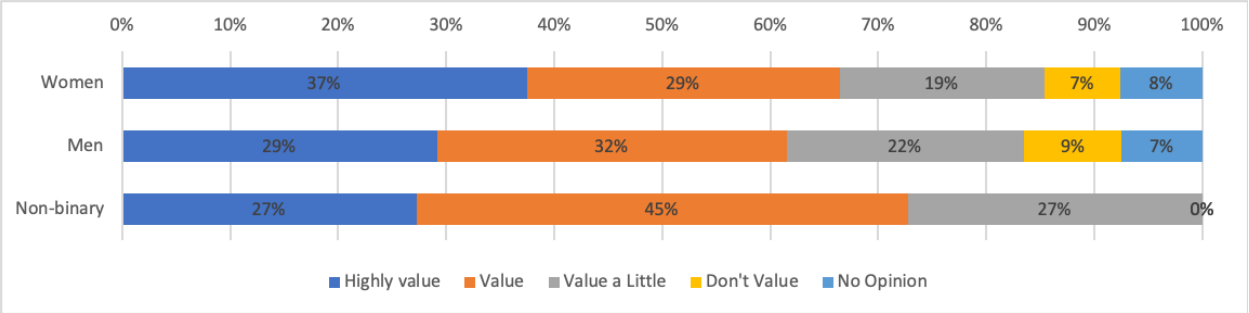


Figure 130: Valuation of the following factor given an increase in the federal budget: Increasing the number of interdisciplinary awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 617, n = 442, n = 11).

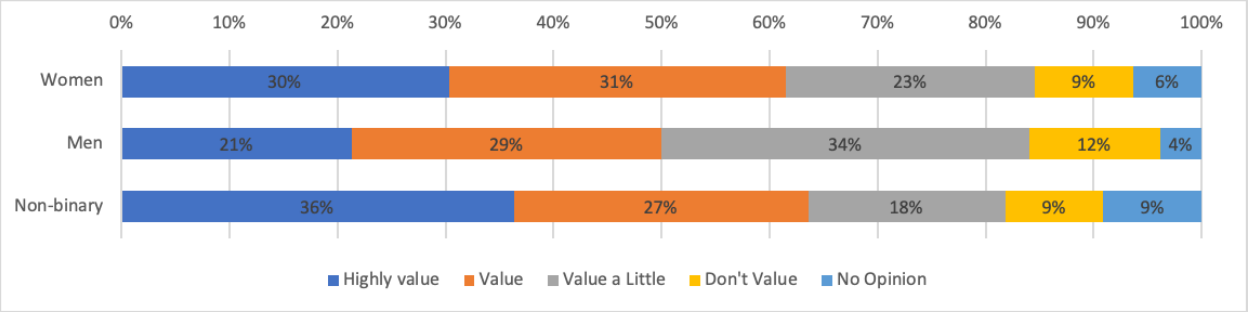


Figure 131: Valuation of the following factor given an increase in the federal budget: Increasing the number of travel awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 616, n = 440, n = 11).

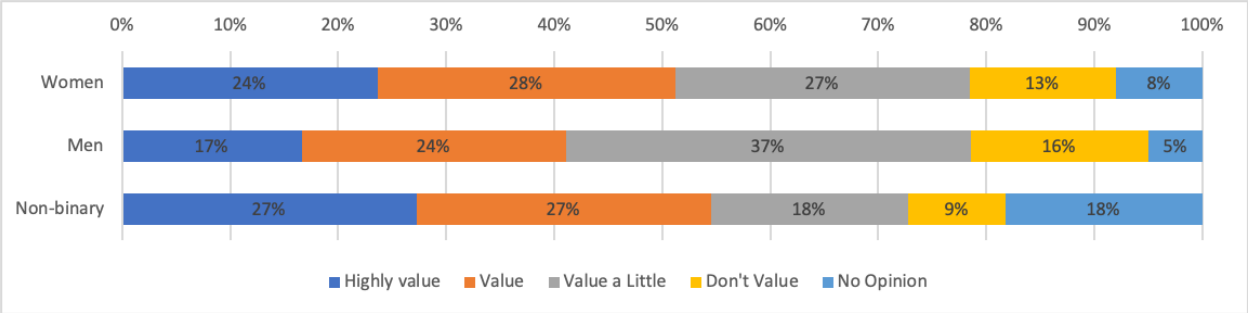


Figure 132: Valuation of the following factor given an increase in the federal budget: Increasing value of travel awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 609, n = 438, n = 11).

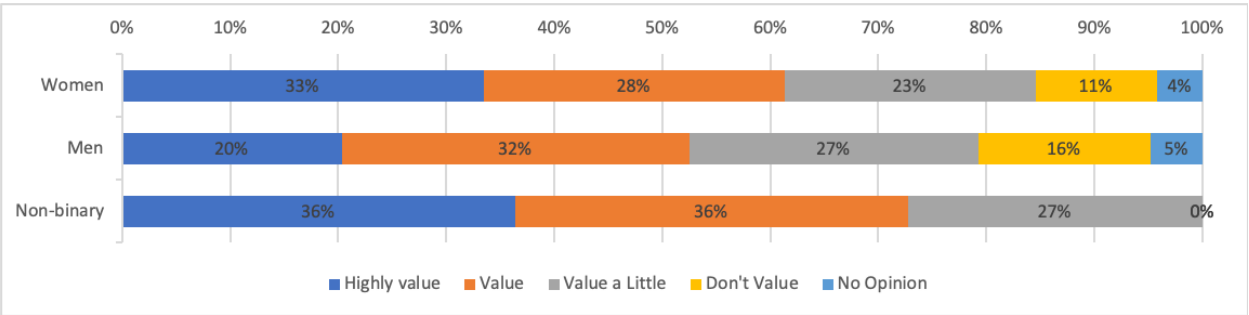


Figure 133: Valuation of the following factor given an increase in the federal budget: Increasing awards for outreach/engagement activities. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 616, n = 438, n = 11). (figure on previous page)

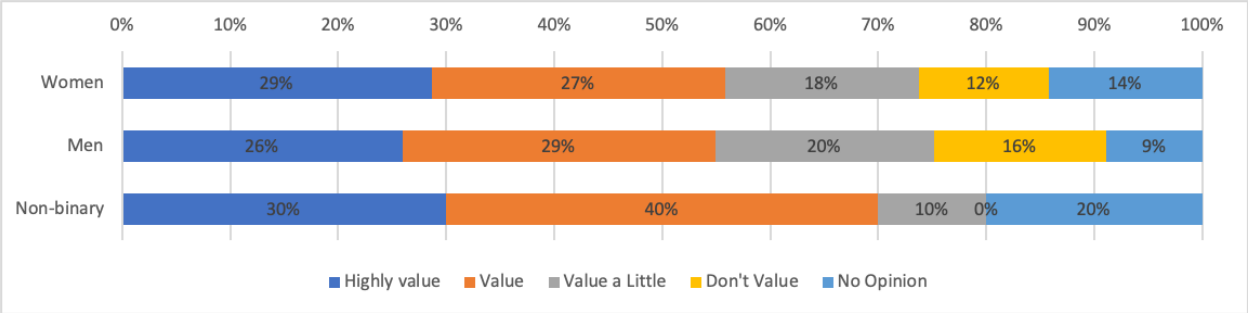


Figure 134: Valuation of the following factor given an increase in the federal budget: Harmonizing value amount of awards across CIHR, NSERC, SSHRC. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 613, n = 439, n = 10).

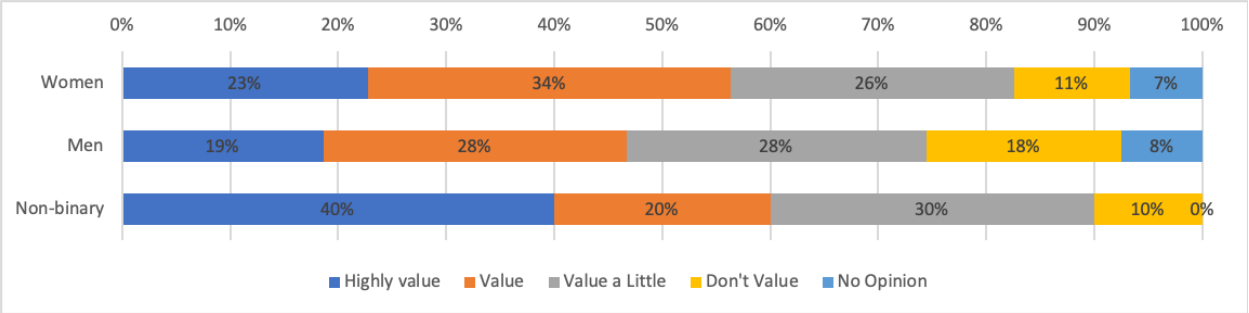


Figure 135: Valuation of the following factor given an increase in the federal budget: Including skills or impact-oriented activities as criteria for evaluation for all awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 614, n = 439, n = 10).

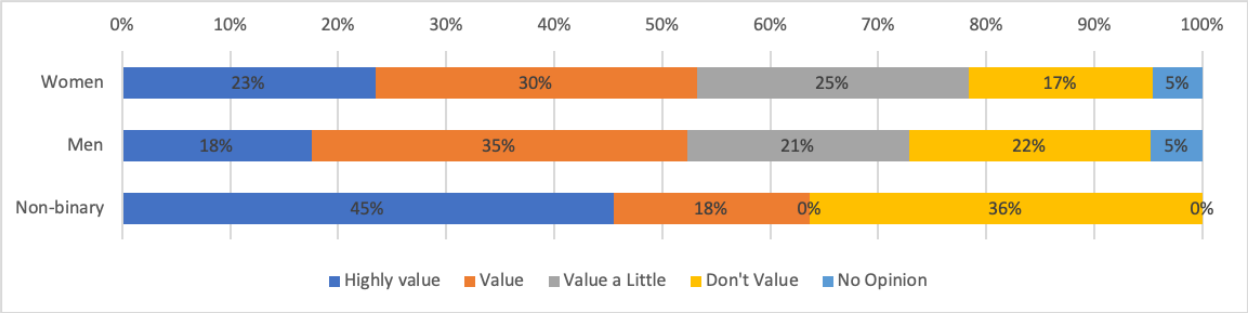


Figure 136: Valuation of the following factor given an increase in the federal budget: Including reports to be filled out by awardees at the end of the award to track outcomes. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 614, n = 438, n = 11).

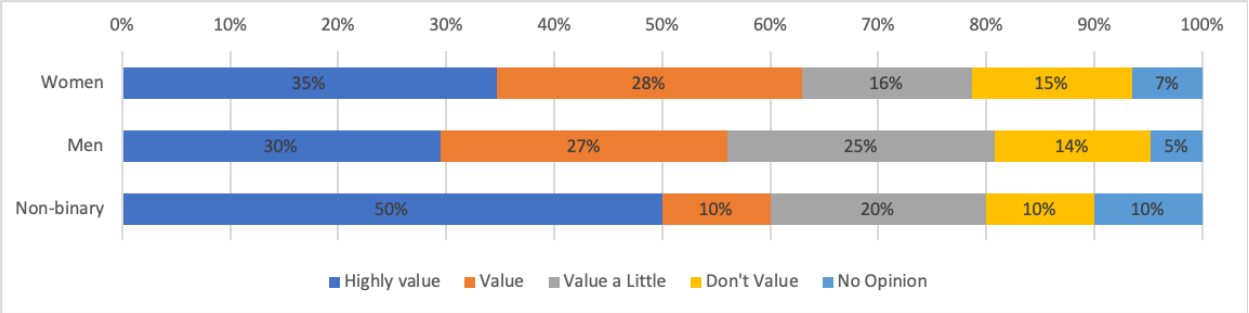


Figure 137: Valuation of the following factor given an increase in the federal budget: Include funding for peripheral support. Respondents were asked to indicate how much they value the above factor if there were an increase in the total federal budget for graduate and postdoctoral awards (n = 615, n = 437, n = 10). Peripheral support may include health/dental benefits, EI/CPP, etc.

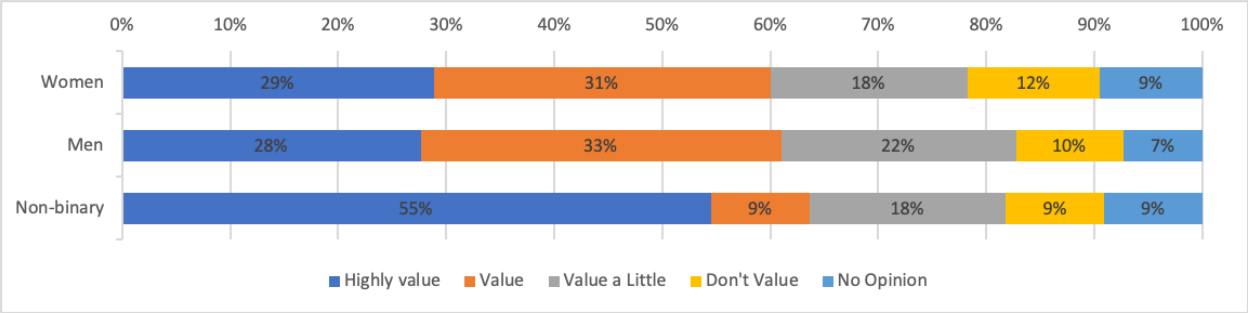


Figure 138: Valuation of the following factor given an increase in the federal budget: More support for awardees with dependents. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 613, n = 441, n = 11).

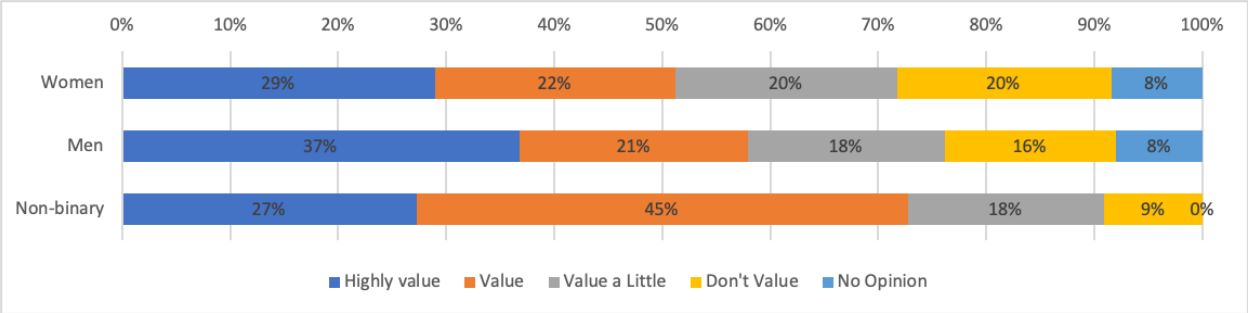


Figure 139: Valuation of the following factor given an increase in the federal budget: Increasing the number of awards open to international applicants. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 615, n = 440, n = 11).

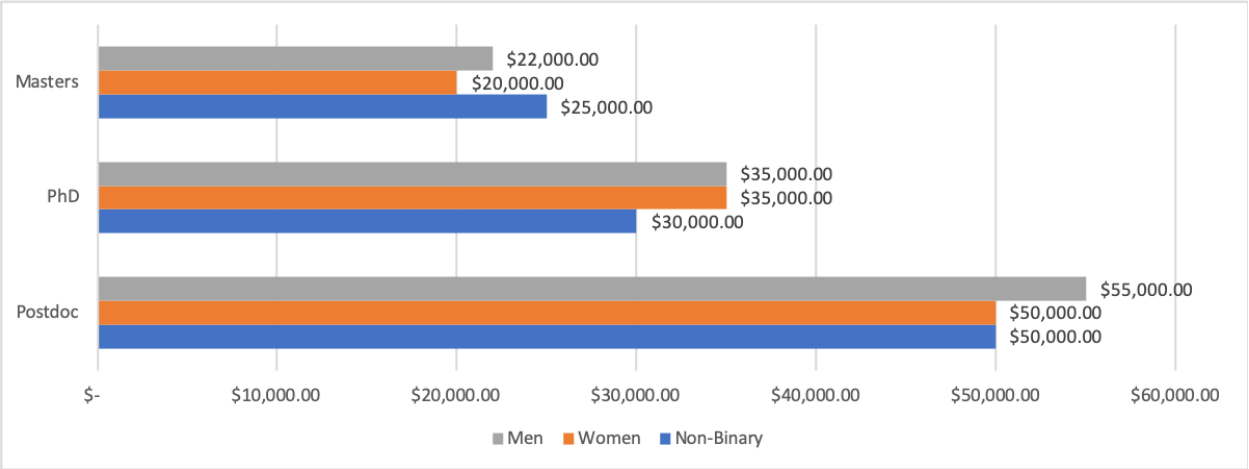


Figure 140: Recommended value of federal awards by level of study. Respondents were asked to generate ideal award values given inflation and the present costs of living in university towns, given there was an increase in the federal budget (n = 457, n = 630, n = 12). Median values are reported.

Conclusions

An important insight from the survey data is that women perceived a 5-10% greater benefit from obtaining their own funding (instead of being supported by a supervisor's grant) compared to men, across all listed benefits. Benefits can be financial or support for research excellence, but this demonstrates that direct funding can provide important support for women pursuing advanced research training.

Furthermore, marginalized genders in science indicated a desire for change on where and how to invest in funding for early career researchers. Given an increase in funding for awards, both non-binary and women respondents indicated they valued creating more awards for outreach and engagement activities. Of note, non-binary respondents highly valued an increase in total awards as well as increased financial support for awardees with dependents. 20% more women than men, as well as non-binary respondents, specifically point out the lack of support for multidisciplinary projects as a barrier to acquiring federal funding for their research projects. Multidisciplinary research has recently been pushed to the fore as a priority for the Canadian government through investment in programs such as the New Frontiers in Research Funds. Based on the data presented above, this investment not only impacts multidisciplinary research itself, but will also support marginalized groups and gender equity in STEM.

Women and non-binary respondents also responded differently than men regarding the scholarship and fellowship review process. The current stringent award criteria, focused on publication record and academic grades, affects award success. While project description was the awarding criterion most highly valued across all respondents regardless of gender, women indicated that reviewers should equally value research-related extracurriculars. In addition, women and non-binary respondents indicated reviewers should value previous publication record less than men. Non-binary respondents indicated, more so than both women and men, that reviewers should value non-academic publications.

Different genders indicated a desire to see a more comprehensive skillset become part of academic research training. Women and non-binary respondents wanted awardee training to include communication to diverse audiences. Both groups also wanted ethics, career development, and management skills to be included in training, more so than men. Women specifically valued the

inclusion of science policy skills into awards above both men and non-binary participants. Therefore, widening the scope of academic skills training will benefit groups that have been historically underrepresented in research.

Overall, the survey highlighted the differences in experience between people with different gender identities. These results can guide policy decisions to create a more inclusive research environment. In particular, improving access to awards for those from marginalized genders provides them with the financial support to pursue an advanced degree. This can be particularly impactful for first-generation university students, or LGBTQ2SIA+ students that have faced additional barriers throughout their educations. SPE encourages the federal funding agencies to collect and report data on gender and LGBTQ2SIA+ representation amongst their awardees.

We recommend as well that funding agencies value more comprehensive scientific skillsets and diversifying awards criteria to support marginalized awardees[6]. In particular, previous success should be de-emphasized in favour of emphasis on research engagement and extracurricular work. We believe that incorporating trainee awards for science outreach, science communication, and other community services, along with increased auxiliary considerations, into the current funding system will create a more inclusive research environment.

[6] . Semeniuk, I.: "Female health scientists face large gender bias in access to federal research dollars, Canadian study reveals. Ivan Semeniuk." *The Global and Mail.* https://www.theglobeandmail.com/business/technology/science/article-female-health-scientists-face-large-gender-gap-in-access-to-federal/

Chapter V: Indigenous Respondents' Perspectives

In this report, we examined the results from respondents who self-identified as Indigenous. While self-identified Indigenous responses only represented approximately 1% of total survey respondents, we still highlighted the results as Indigenous peoples are severely underrepresented in academia. Indeed, we captured a relatively accurate degree of representativeness in our cohort: as of 2016, 4.9% of the Canadian population has an indigenous identity[7], and of this group, 48% holds a postsecondary qualification[8]. We also wish to acknowledge that Indigenous identity is not mutually exclusive of any of the other identities (gender, disability, other racial minorities) reported in the precedent or subsequent chapters.

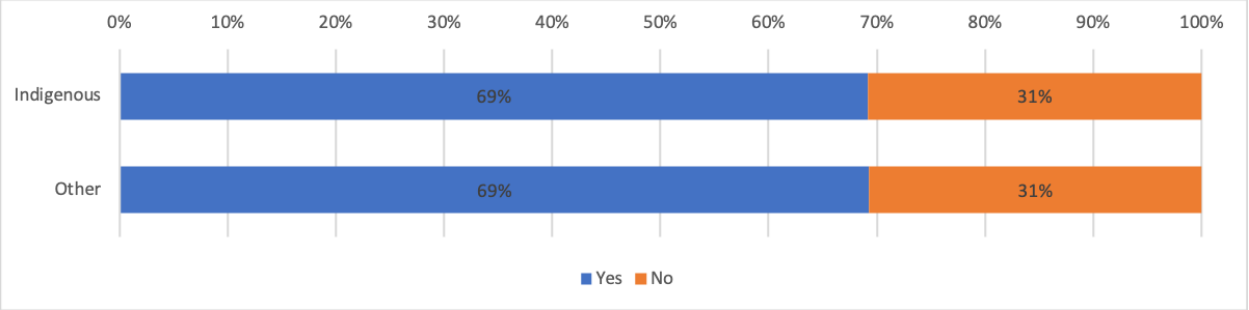


Figure 141: *Have you ever applied for a graduate or postdoctoral fellowship through CIHR, NSERC, or SSHRC?* (n = 13, n = 1079)

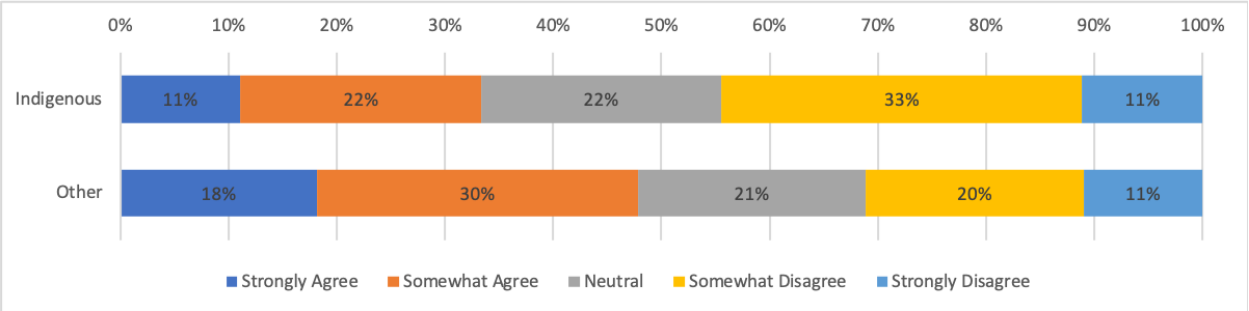


Figure 142: *Please state to what degree you agree with the following statement: I received adequate resources to help me complete my application.* Respondents who applied for a federal grant were asked to state their agreeance with the above statement (n = 9, n = 748).

[7] Statistics Canada: "Aboriginal peoples in Canada: Key results from the 2016 Census." https://www150.statcan.gc.ca/n1/daily-quotidien/171025/dq171025a-eng.htm?indid=14430-1&indgeo=0
[8] Statistics Canada: "The educational attainment of Aboriginal peoples in Canada, Statistics Canada." https://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/99-012-x2011003_3-eng.cfm

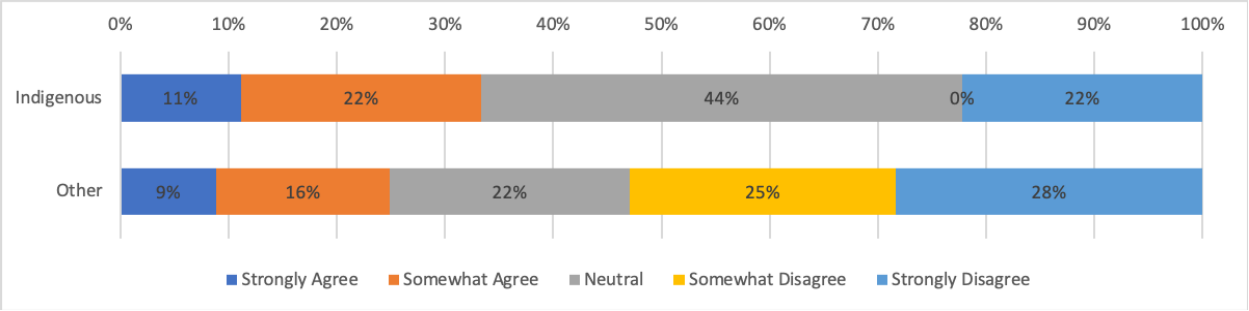


Figure 143: *Please state to what degree you agree with the following statement: I received useful feedback from my application, whether or not it was successful?* Respondents who applied for a federal grant were asked to state their agreeance with the above statement (n = 9, n = 744). (figure on previous page)

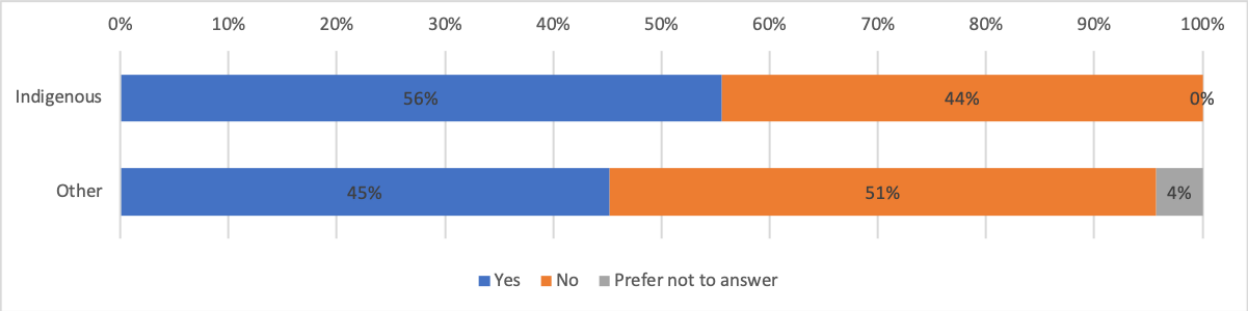


Figure 144: *Were any of your application(s) successful?* Respondents who applied for a federal grant were asked to state if their application was successful (n = 9, n = 748).

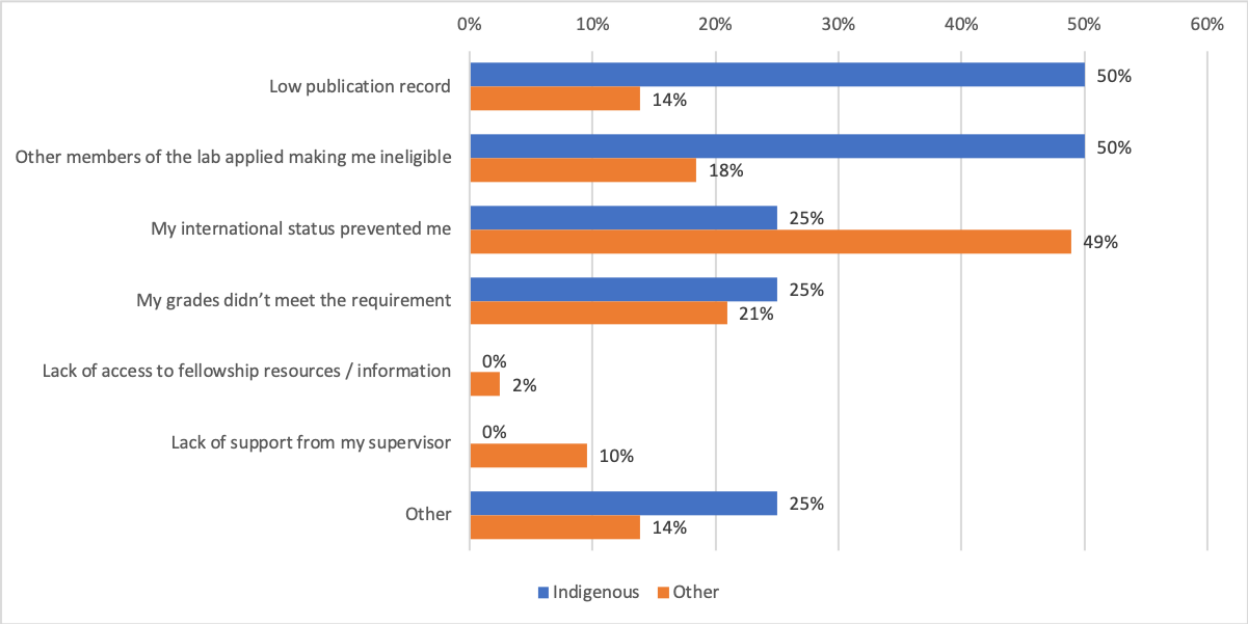


Figure 145: *What prevented you from applying?* Respondents were asked to indicate the reason that prevented them from applying for fellowships/scholarships (n = 4, n = 325).

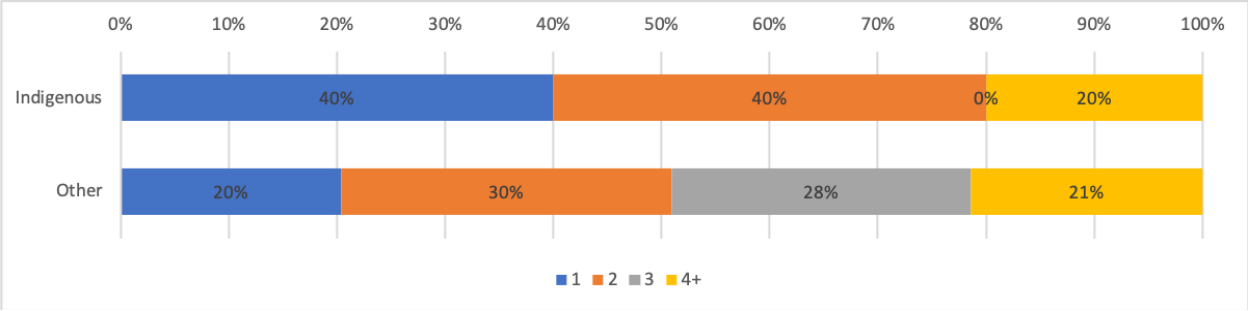


Figure 146: *How many federal fellowships/studentships have you applied for?* Successful awardees disclosed the number of federal grants to which they applied. 5 of the 9 indigenous scholars which applied were successful (n = 5, n = 387).

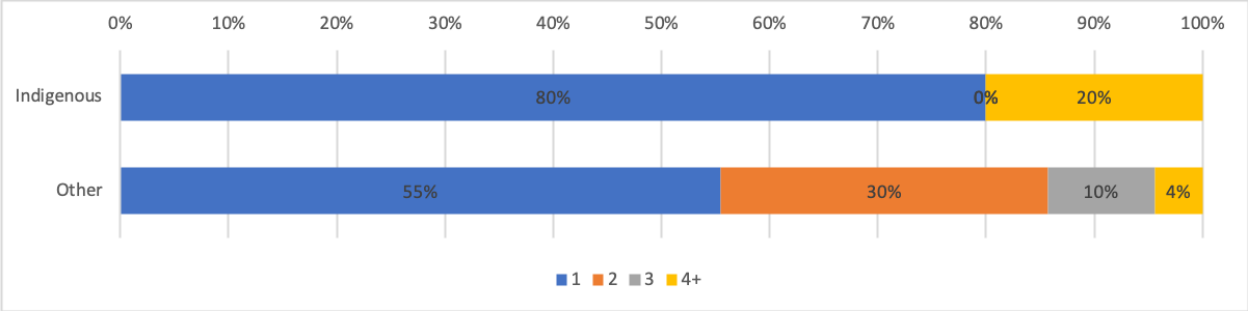


Figure 147: *How many of your federal fellowship/studentship applications have been successful?* Successful awardees disclosed the number of federal grants they received. 5 of the 9 indigenous scholars which applied were successful (n = 5, n = 384).

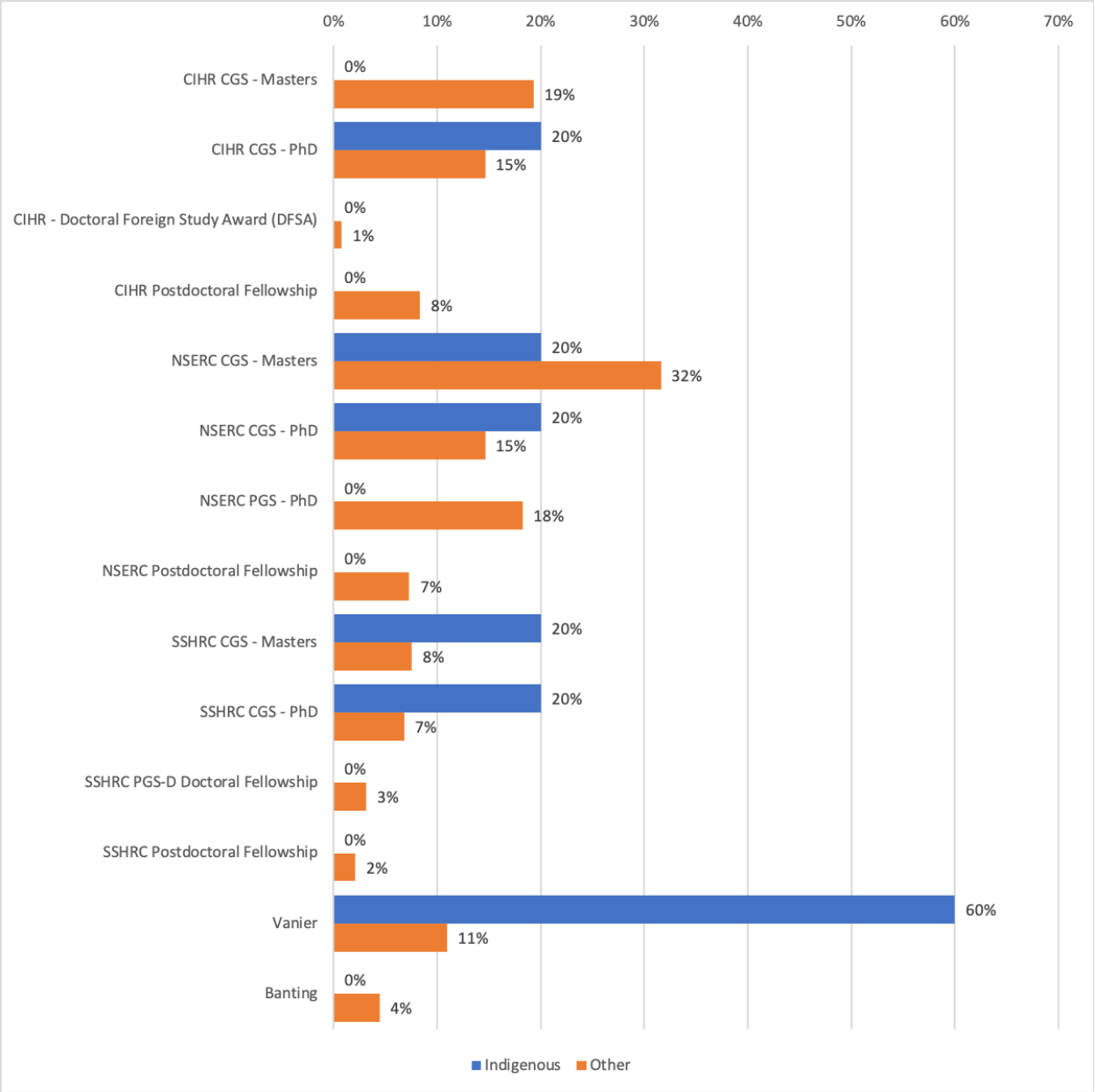


Figure 148: *Federal awards received.* Respondents noted which awards they successfully received, with more than one award per applicant possible (n = 5, n = 383).

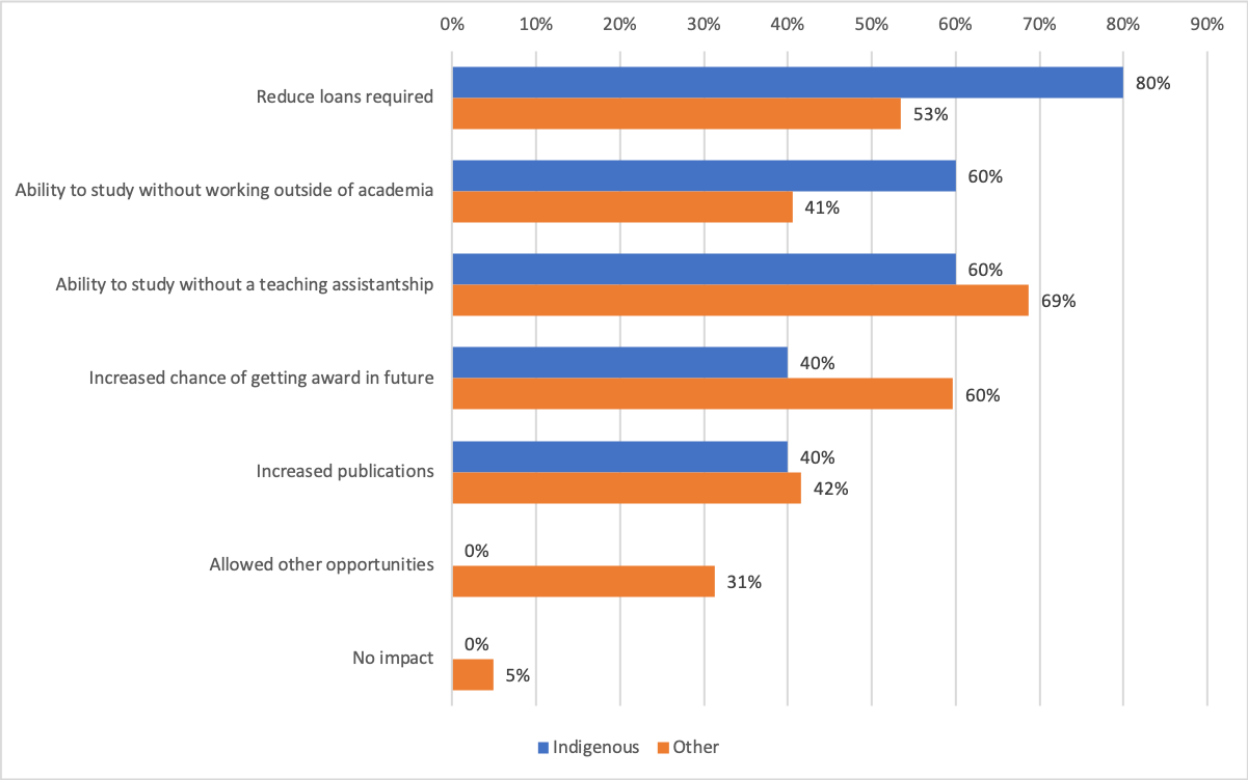


Figure 149: *What impact did receiving an award have on you and your research?* Benefits of receiving an award on successful awardees, by percent (n = 5, n = 387).

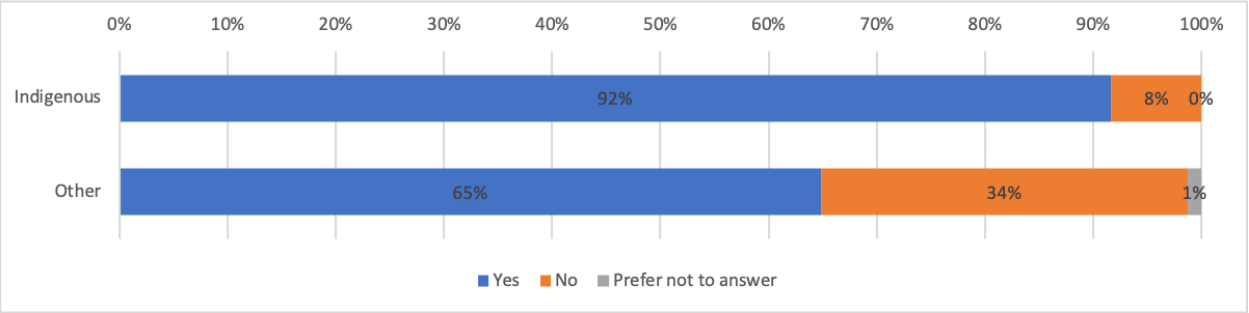


Figure 150: *Did you require other sources of funding during the duration of this award?* Percent of respondents who required other sources of funding while holding their award (n = 12, n = 387).

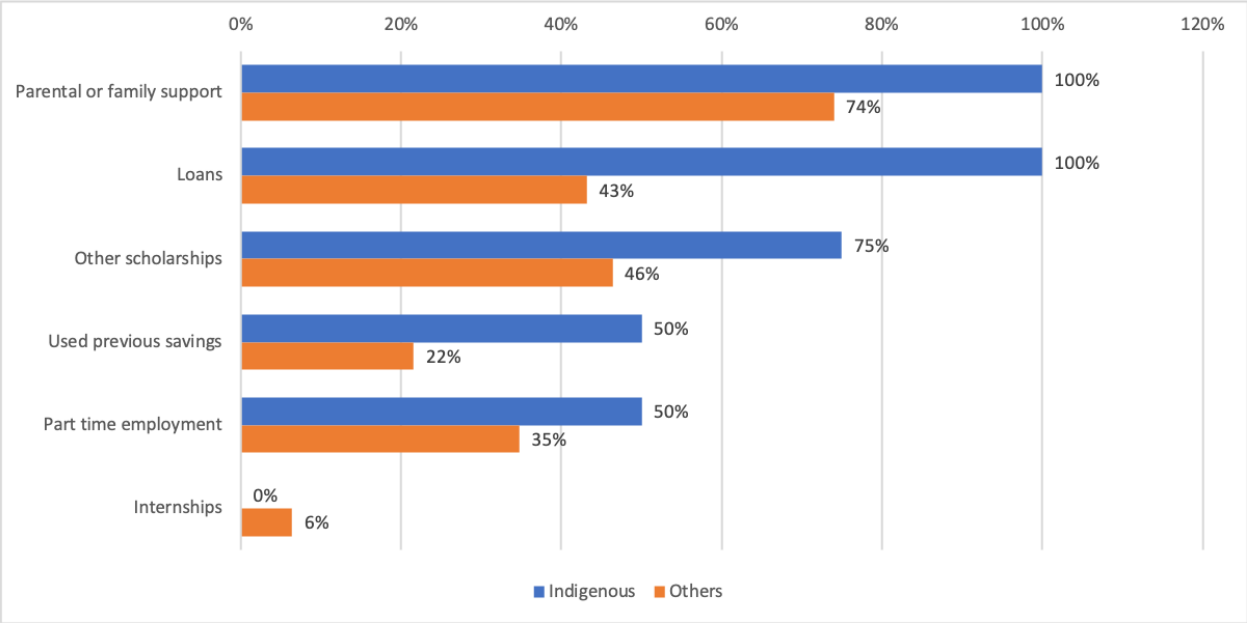


Figure 151: *For those who required other sources of funding during the duration of this award, what type of support did you seek/receive?* Respondents who answered in the affirmative for the above question noted the alternative support they received in addition to their award (n = 5, n = 386).

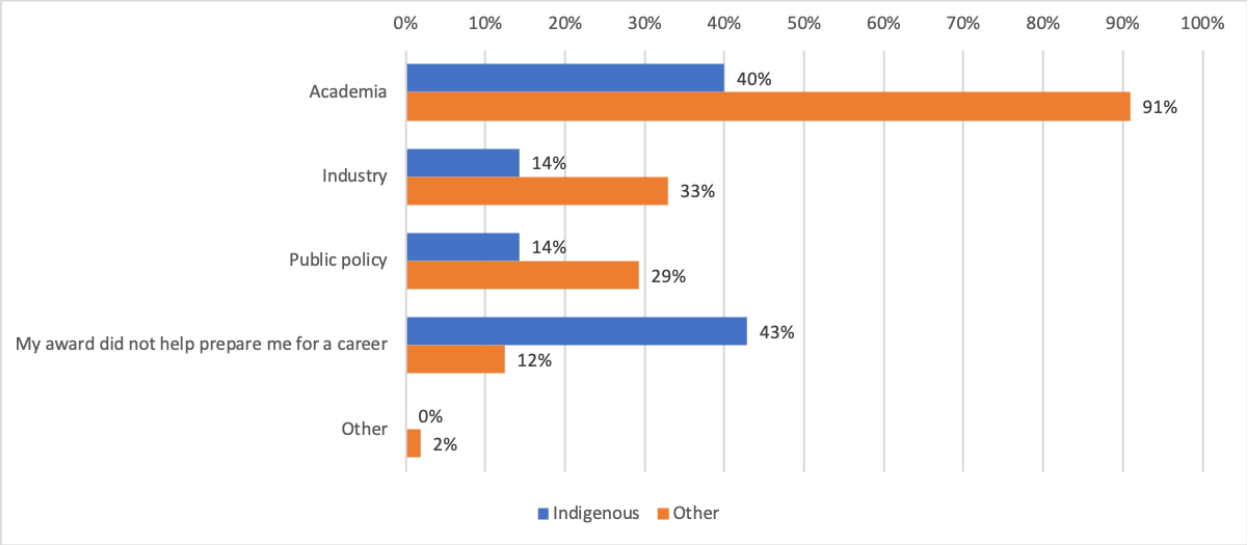


Figure 152: Assistance of federal awards towards diverse career preparation, by number of respondents. Trainees were asked to specify which career paths and industries their award helped them prepare for. Multiple answers possible. 337 respondents indicated that their award prepared them best for a career in academia (n = 5, n = 386).

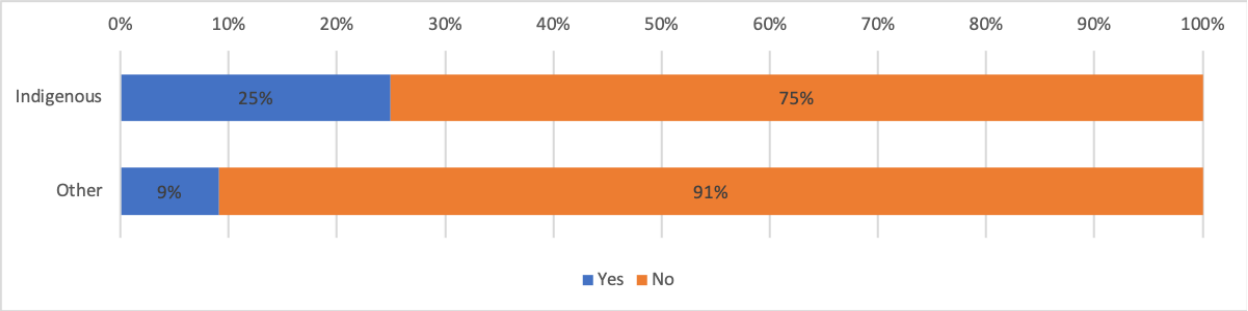


Figure 153: *Did receiving an award have a negative effect on your career or experience?* (n = 12, n = 385).

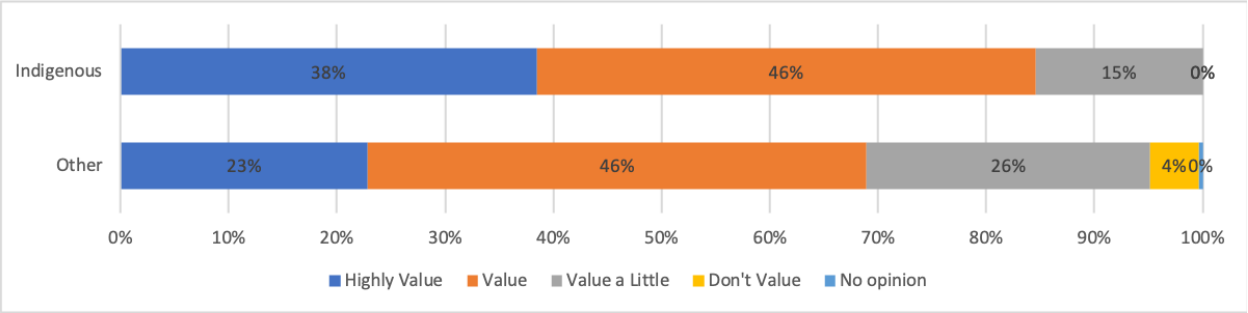


Figure 154: Ideal valuation of fellowship application criteria by reviewers: Academic record. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 987).

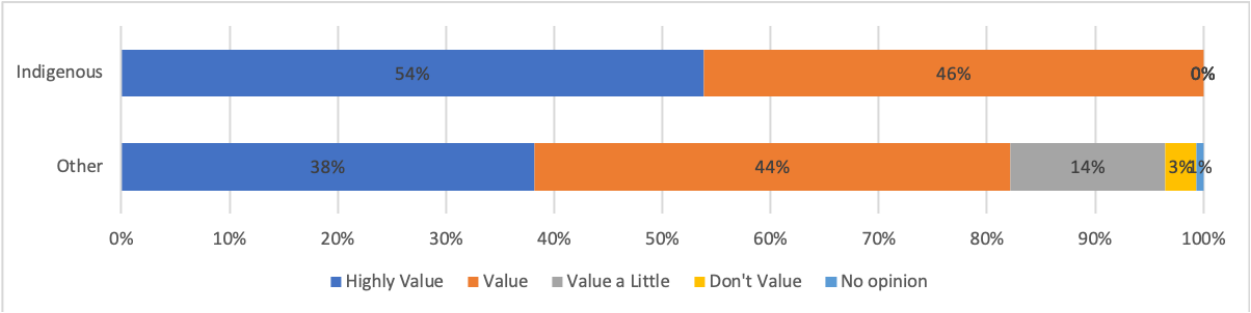


Figure 155: Ideal valuation of fellowship application criteria by reviewers: Research-related extracurricular involvement. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 995).

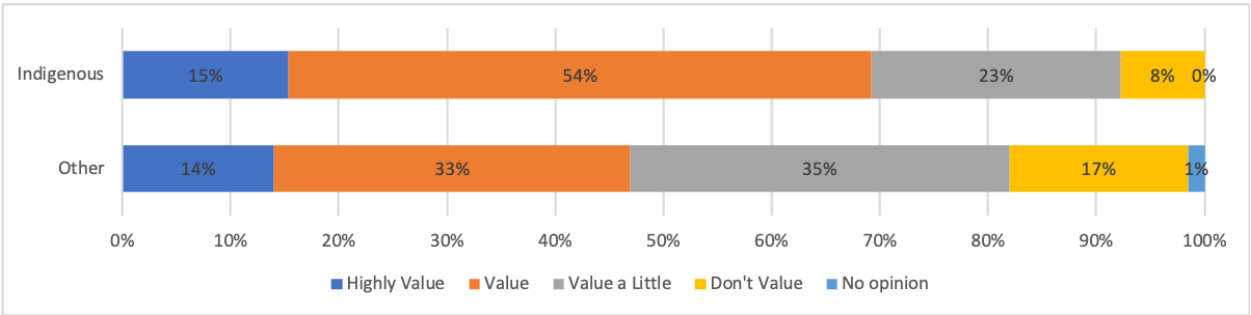


Figure 156: Ideal valuation of fellowship application criteria by reviewers: All other types of extracurricular involvement. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 993). (figure on previous page)

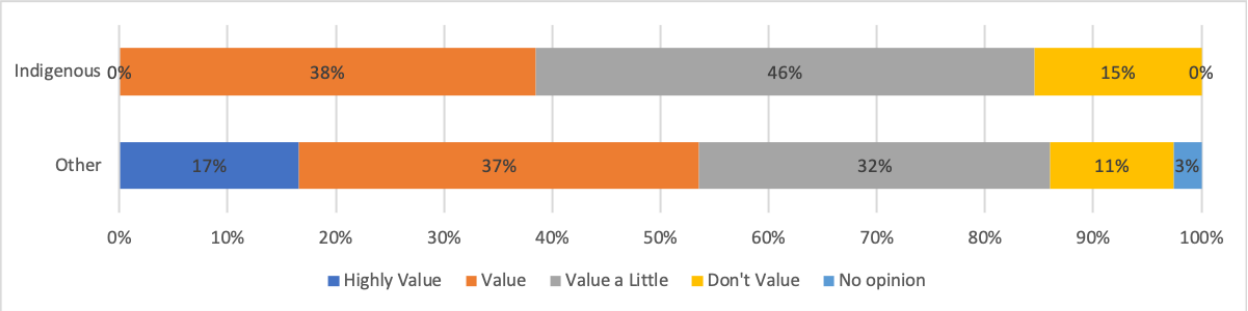


Figure 157: Ideal valuation of fellowship application criteria by reviewers: International collaboration. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 993).

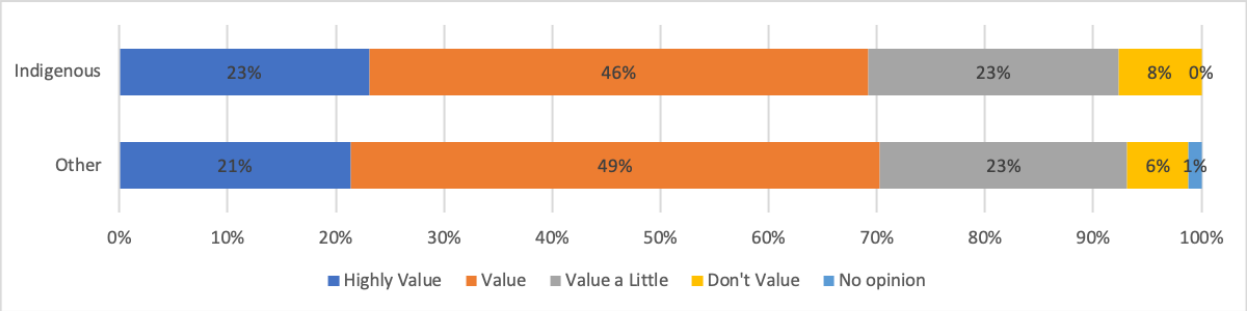


Figure 158: Ideal valuation of fellowship application criteria by reviewers: Mentorship activities. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 991).

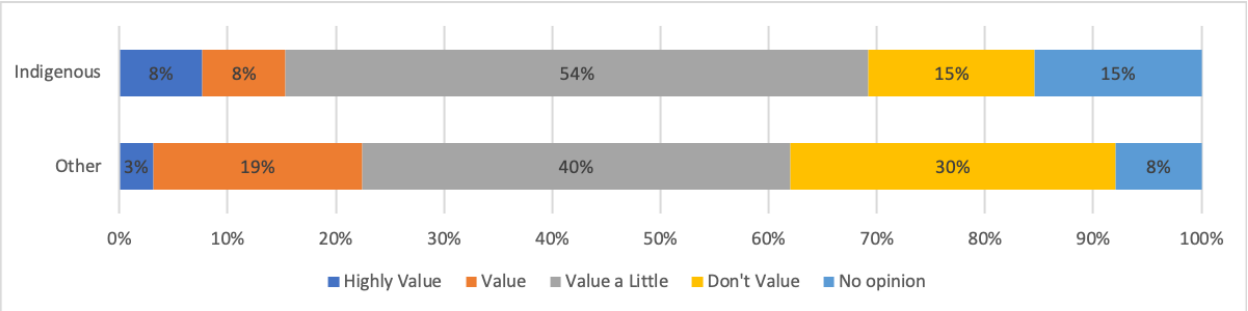


Figure 159: Ideal valuation of fellowship application criteria by reviewers: Non-academic publications. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 991). Non-academic publications may include books, op-eds, blogs, and white papers. (figure on previous page)

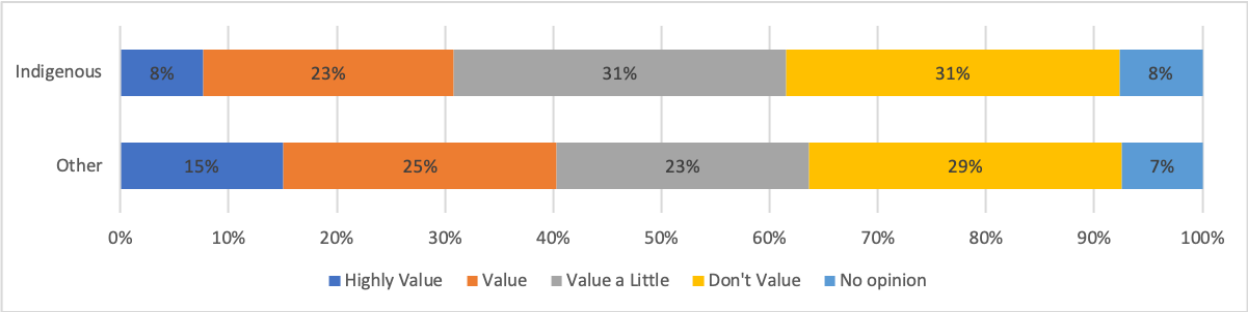


Figure 160: Ideal valuation of fellowship application criteria by reviewers: Periods of leave. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 994). Periods of leave include those for academic, parental, personal health, familial health, or other reasons.

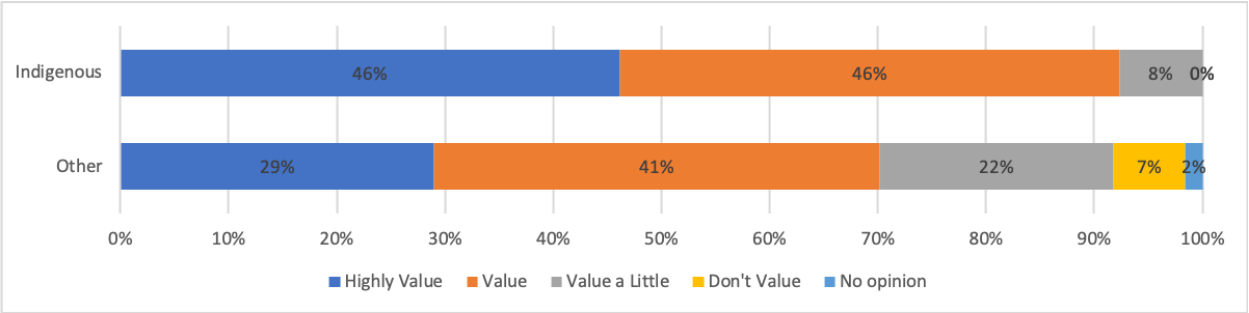


Figure 161: Ideal valuation of fellowship application criteria by reviewers: Potential societal impacts of the research. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 991).

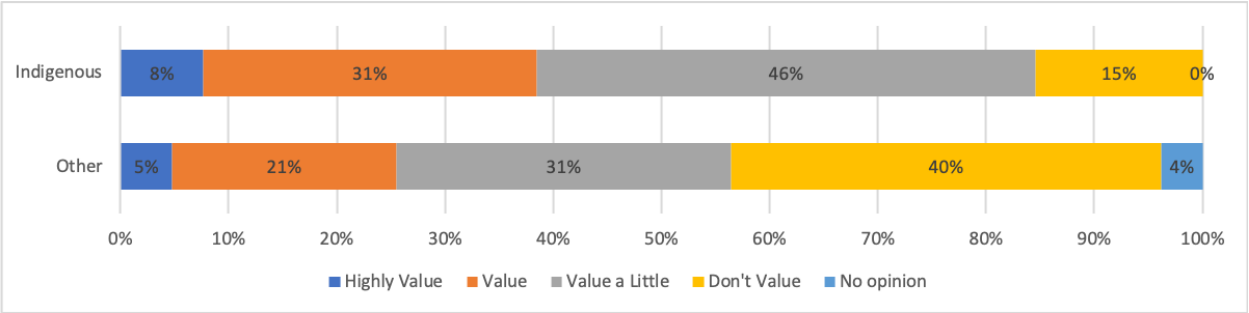


Figure 162: Ideal valuation of fellowship application criteria by reviewers: Prestige of the institution or of your supervisor. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 991).

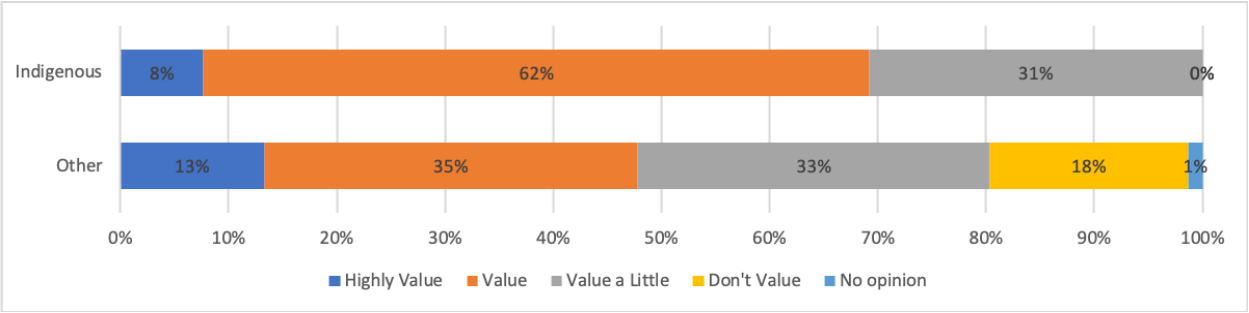


Figure 163: Ideal valuation of fellowship application criteria by reviewers: Previous success with awards (distinctions). Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 987).

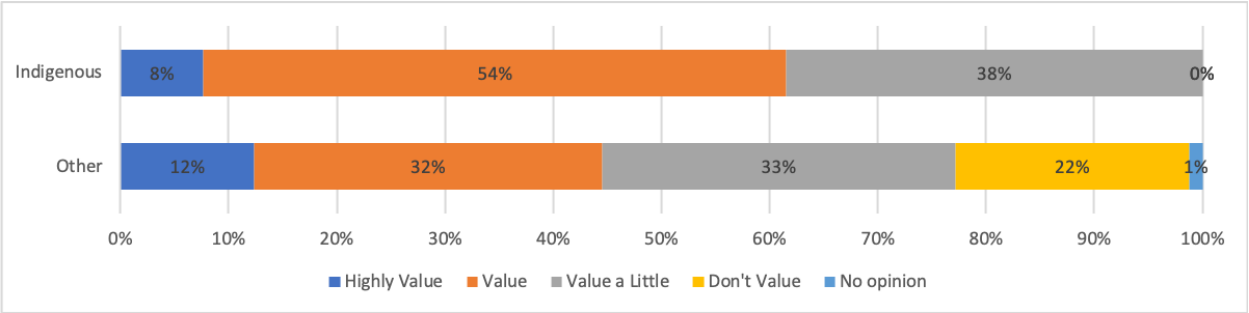


Figure 164: Ideal valuation of fellowship application criteria by reviewers: Previous success with scholarships and fellowships. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 995).

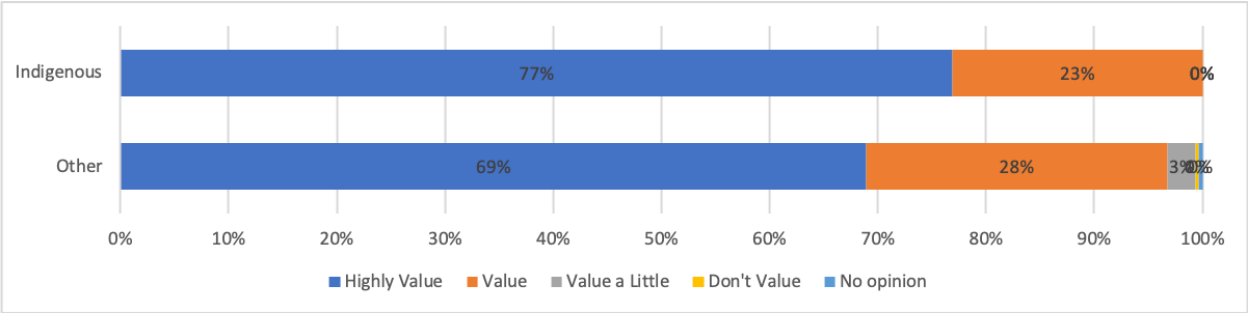


Figure 165: Ideal valuation of fellowship application criteria by reviewers: Project description / proposal. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 994).

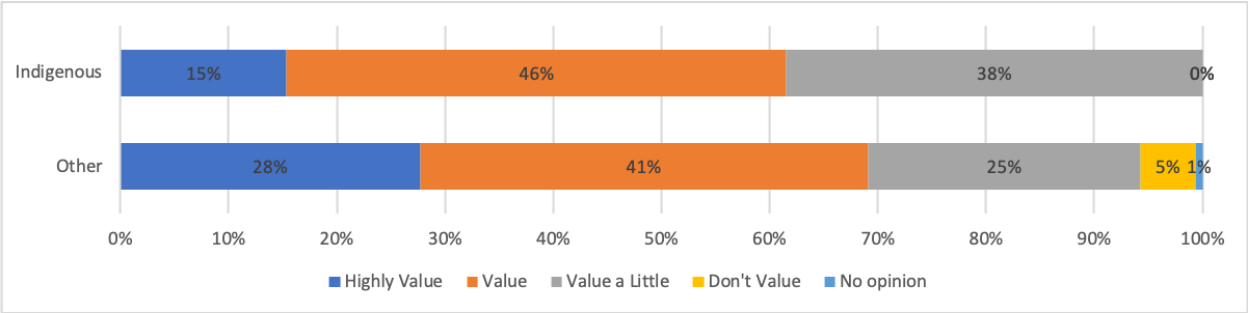


Figure 166: Ideal valuation of fellowship application criteria by reviewers: Publication record. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 995). (figure on previous page)

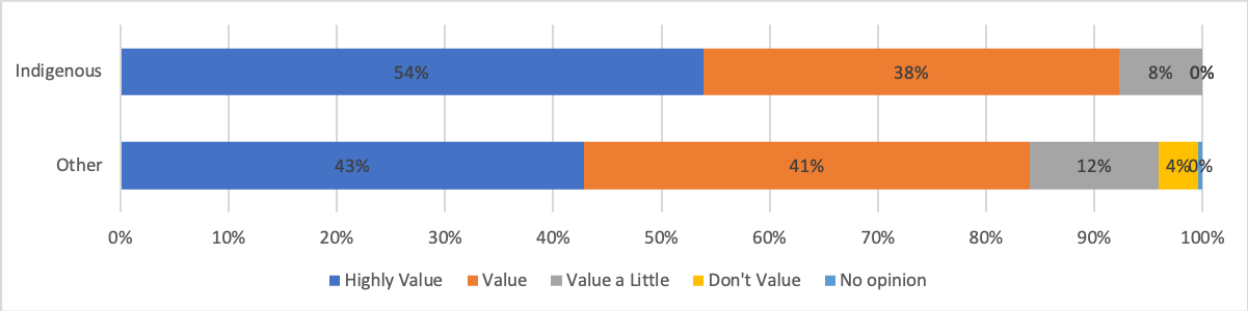


Figure 167: Ideal valuation of fellowship application criteria by reviewers: Reference letters. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 994).

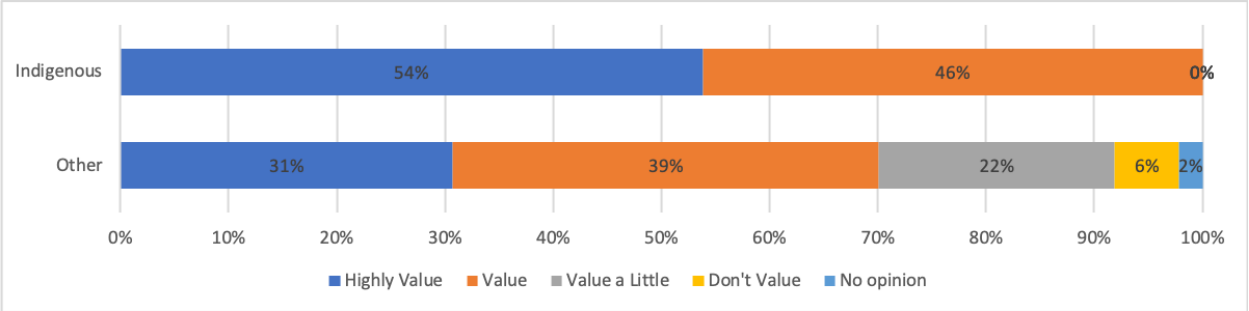


Figure 168: Ideal valuation of fellowship application criteria by reviewers: Societal importance of the challenge the research seeks to address. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 994).

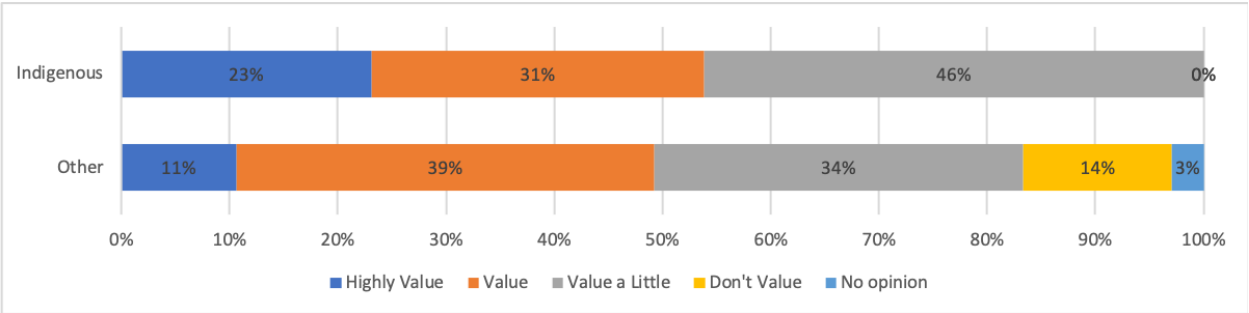


Figure 169: Ideal valuation of fellowship application criteria by reviewers: Teaching / TAship. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 13, n = 993).

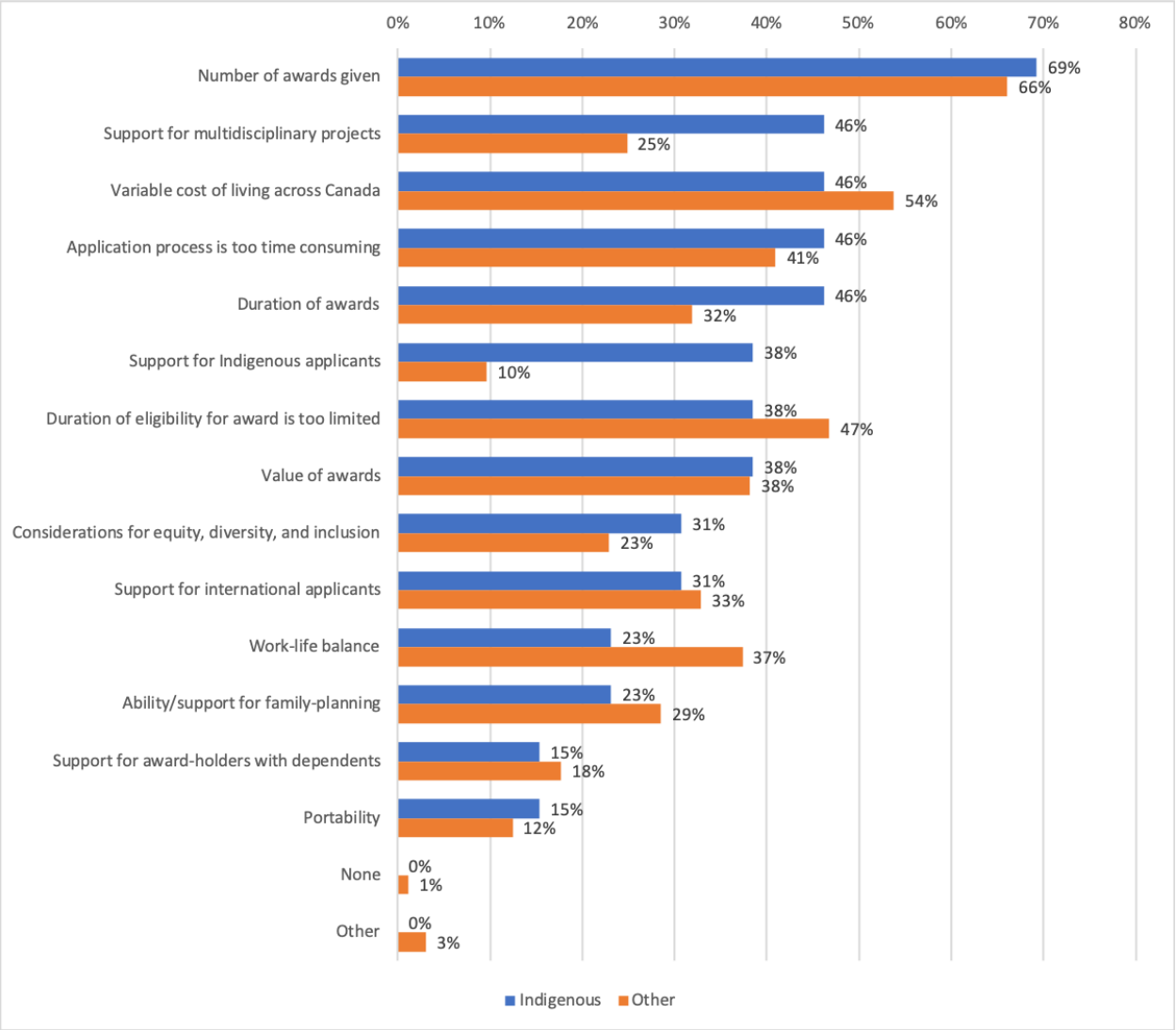


Figure 170: Barriers and problems for award opportunities for indigenous researchers, by percent. Respondents were asked to identify barriers they perceived or faced when applying to federal scholarships and fellowships (n = 13, n = 1119). Multiple selections possible. Over one third (38%) of indigenous applicants cite a lack of support for indigenous persons as a barrier.

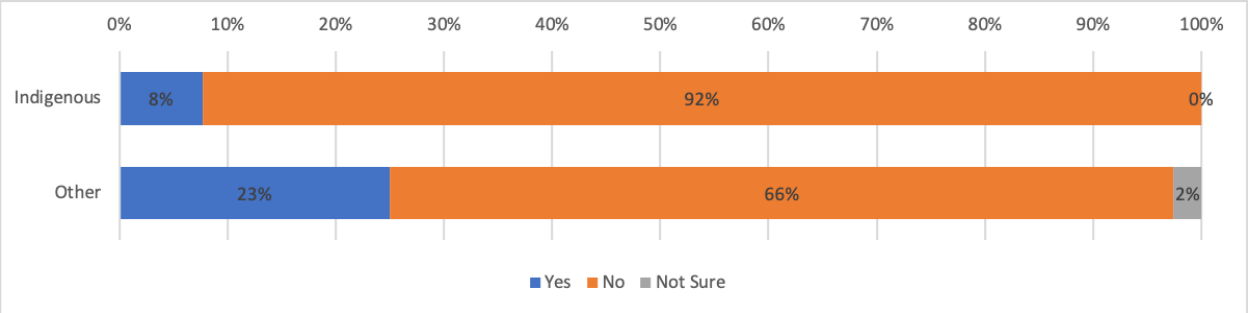


Figure 171: *Do you think your field of research is not adequately represented by the awards opportunities available from CIHR, NSERC, or SSHRC?* By percent (n = 13, n = 1119).

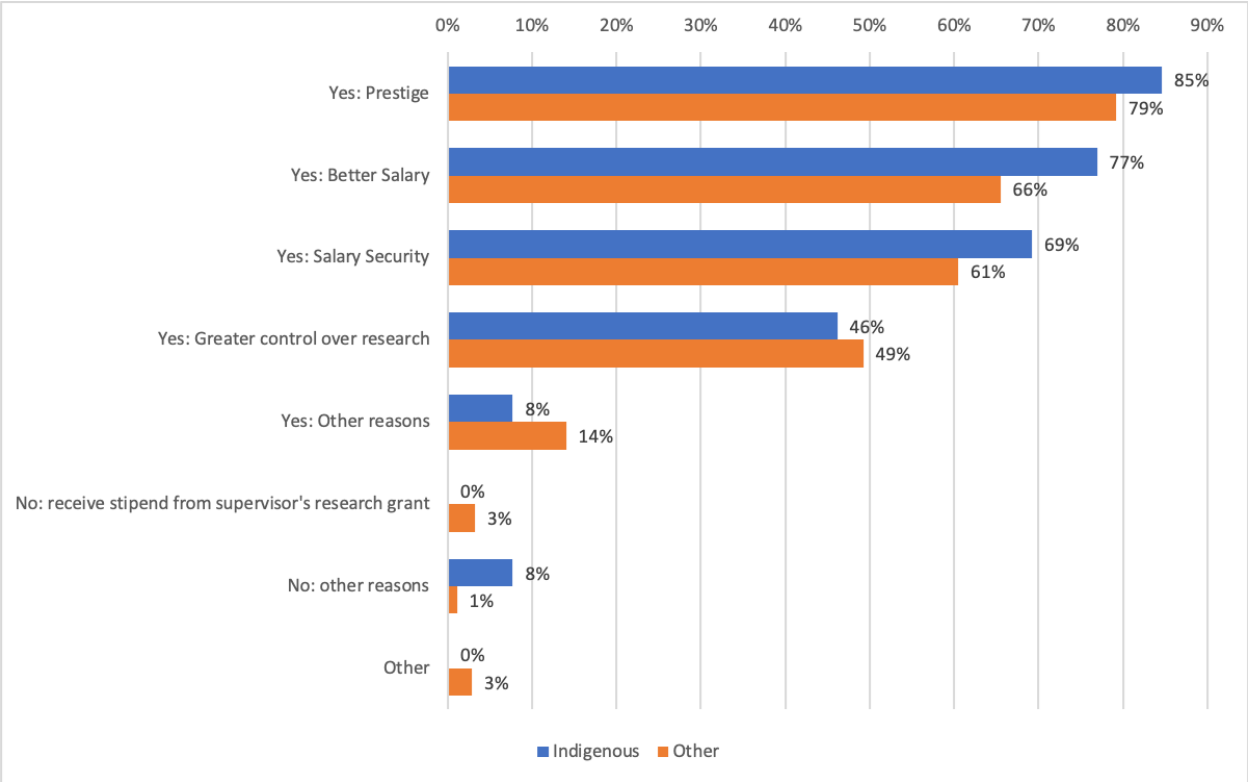


Figure 172: Benefits of obtaining funding from awards, rather than from supervisor's research grant, by percent (n = 13, n = 1119). Multiple selections possible. Indigenous respondents perceive greater benefits regarding prestige and salary from their awards than all other respondents.

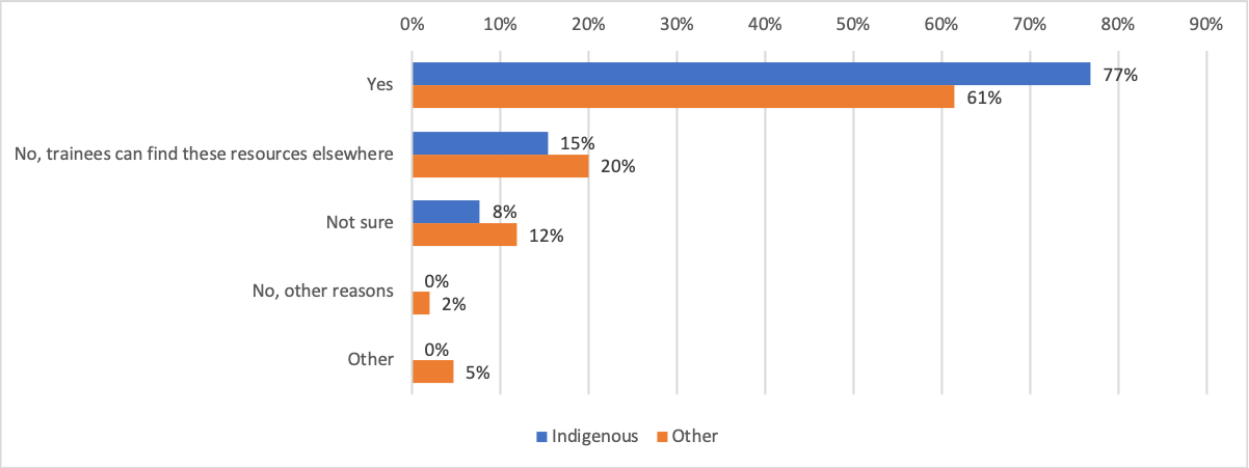


Figure 173: *Do you think that scholarships and fellowships should help to prepare trainees for diverse careers outside of academia?* By percent (n = 13, n = 1119).

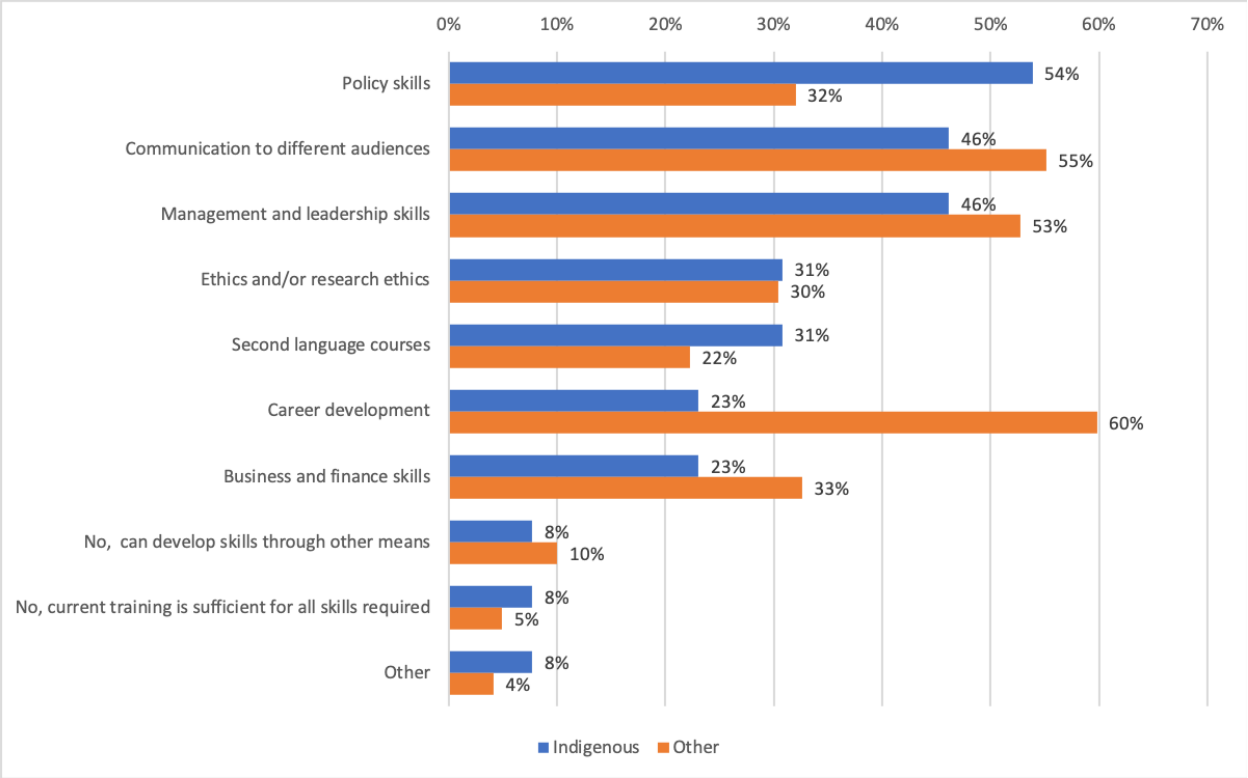


Figure 174: Skills desired to be incorporated into academic training, by percent. Multiple responses possible (n = 13, n = 1119). 54% of indigenous respondents indicated they would encourage policy skills to be integrated into academic training. (figure on previous page)

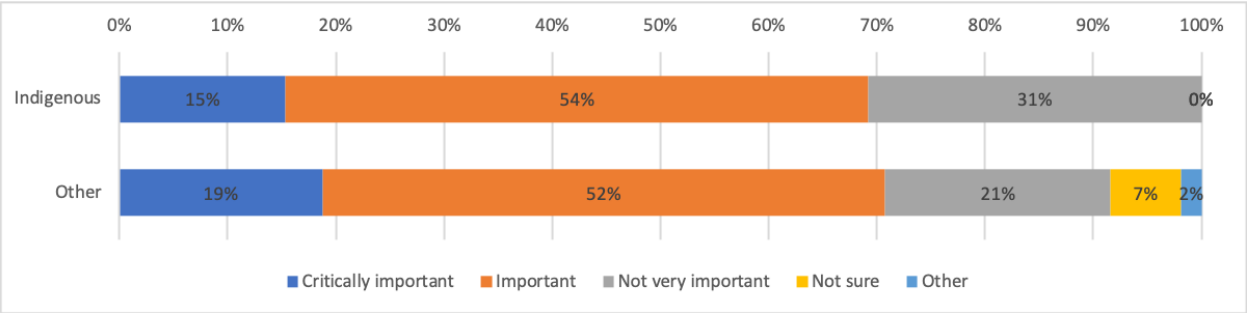


Figure 175: Importance of elite awards, by percent. Respondents were asked to evaluate the importance of the elite Vanier doctoral and Banting postdoctoral awards (n = 13, n = 1119).

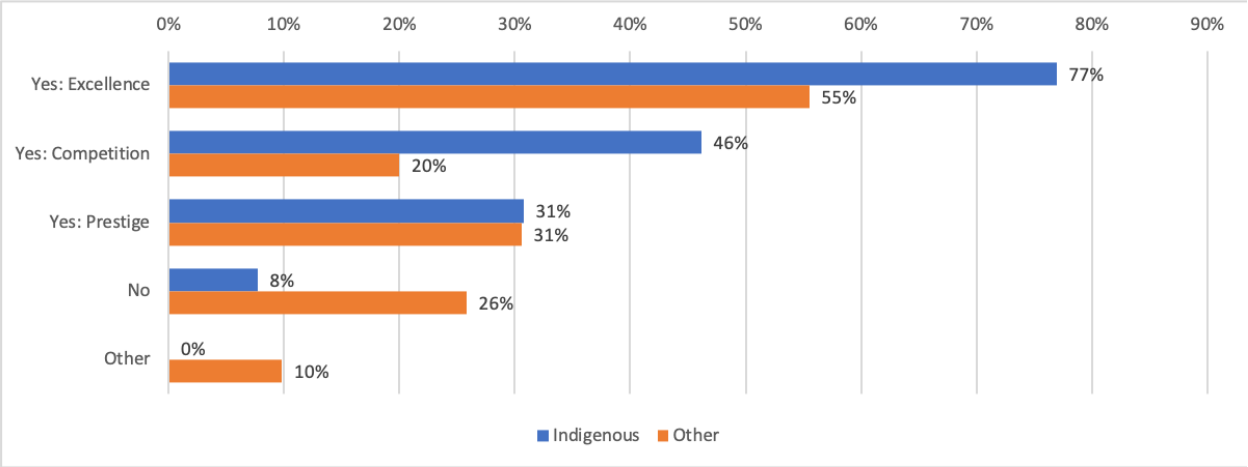


Figure 176: *Are elite awards a beneficial part of the current funding system?* Multiple selections possible (n = 13, n = 1119).

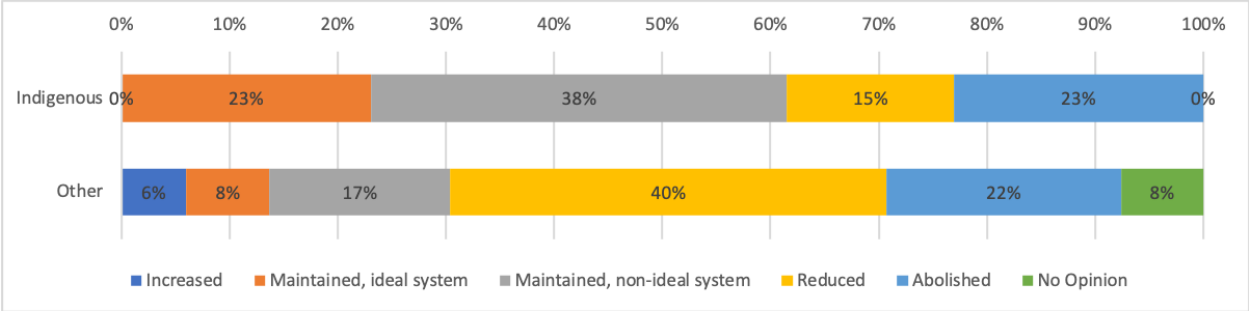


Figure 177: Recommendations for the elite awards system, by percent. Elite awards provide greater levels of support and prestige for select trainees, but the investment required reduces the total number of potential awards available. In considering this, applicants were asked to state their opinion of the current elite awards system (n = 13, n = 1119).

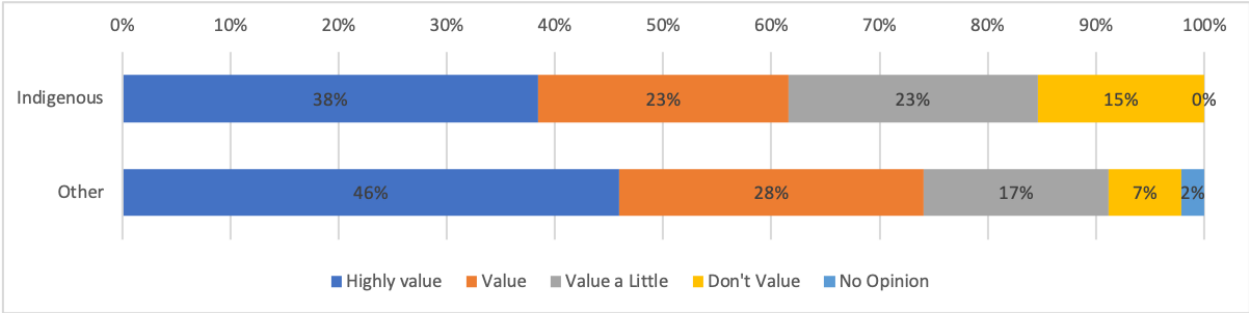


Figure 178: Valuation of the following factor given an increase in the federal budget: Increasing value of all scholarships and fellowships. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1084).

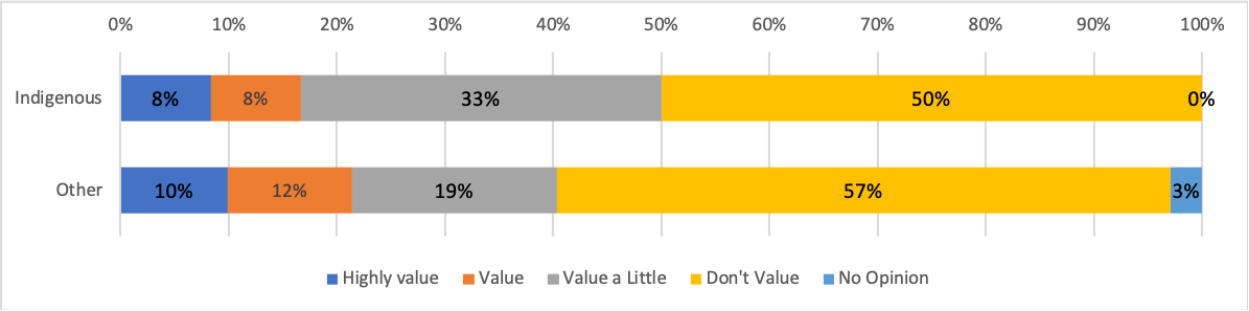


Figure 179: Valuation of the following factor given an increase in the federal budget: Increasing value of elite awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1069).

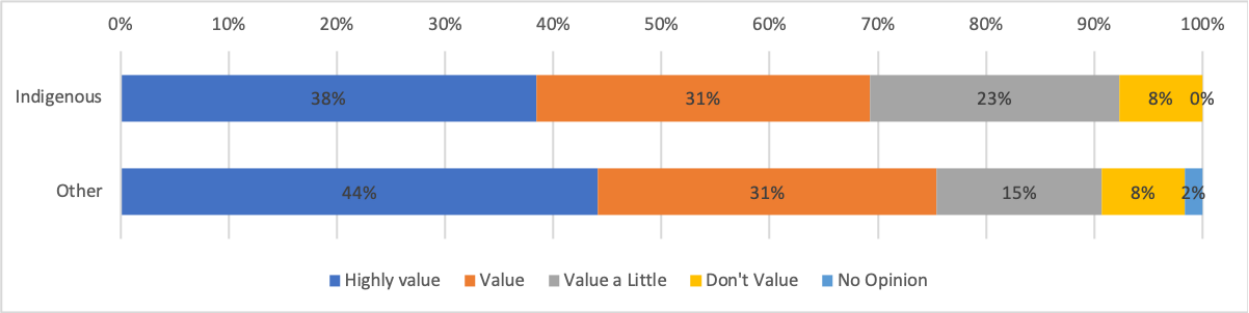


Figure 180: Valuation of the following factor given an increase in the federal budget: Increasing value of standard awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1078).

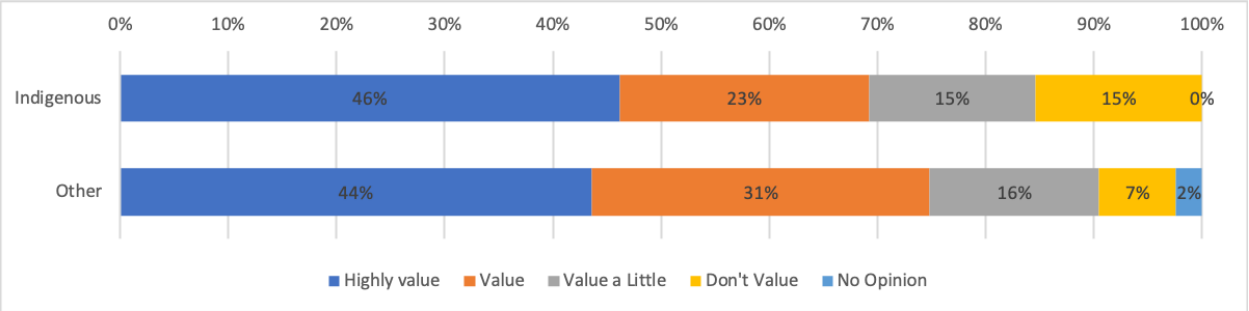


Figure 181: Valuation of the following factor given an increase in the federal budget: Increasing value of all graduate student awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1086).

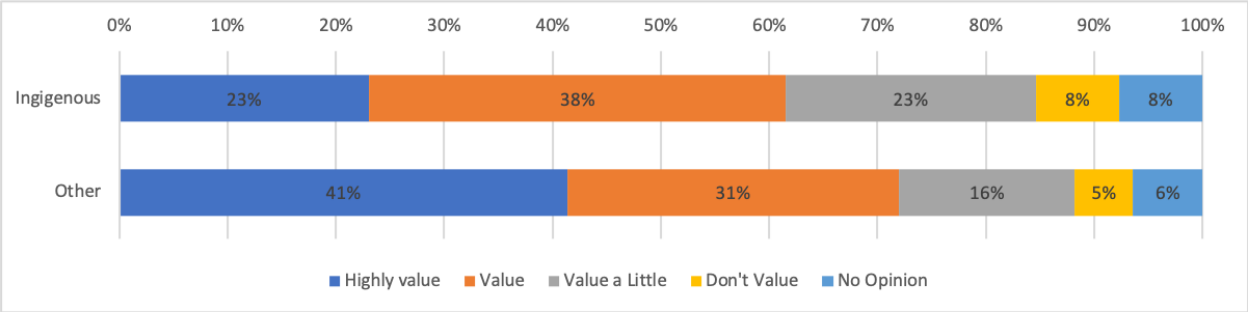


Figure 182: Valuation of the following factor given an increase in the federal budget: Increasing value of postdoctoral awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1079). (figure on previous page)

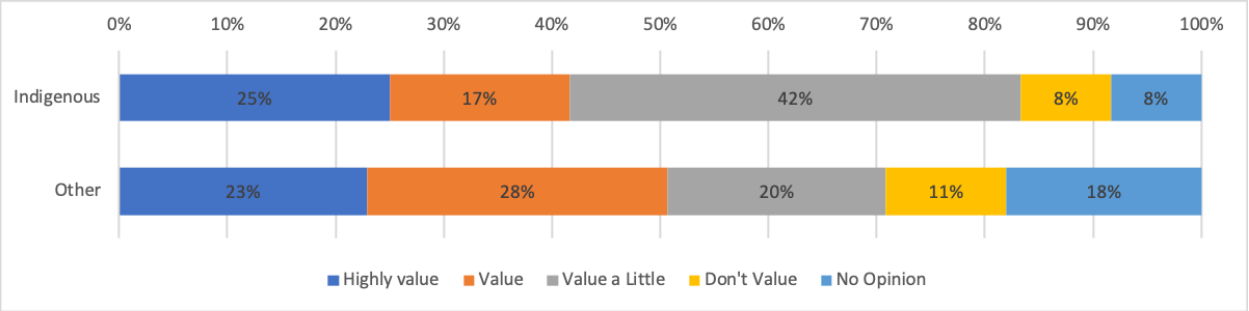


Figure 183: Valuation of the following factor given an increase in the federal budget: Increasing the value of specifically PGS-D Awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1061).

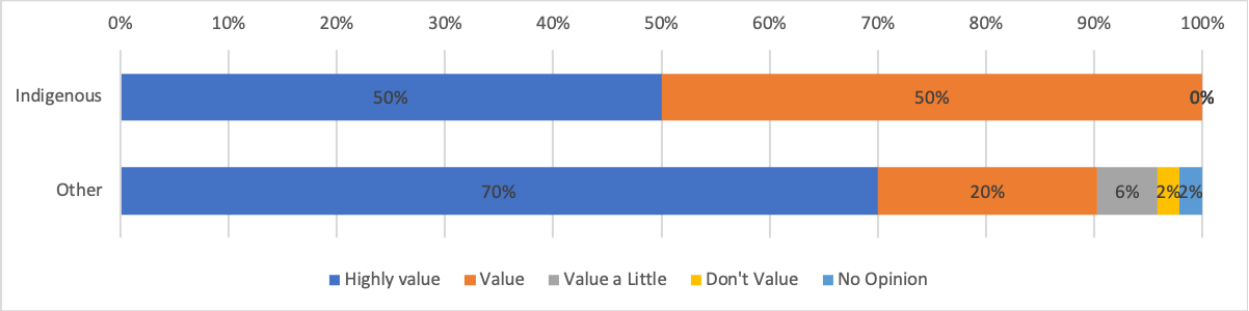


Figure 184: Valuation of the following factor given an increase in the federal budget: Increasing the total number of fellowships given. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1082).

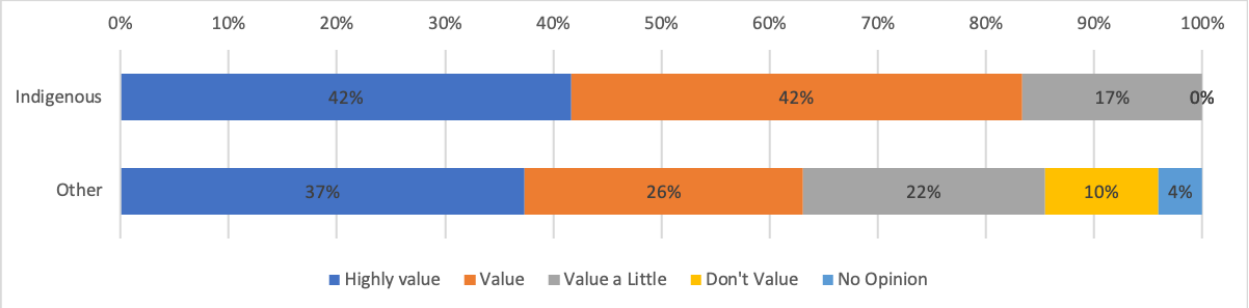


Figure 185: Valuation of the following factor given an increase in the federal budget: Increasing length of awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1078).

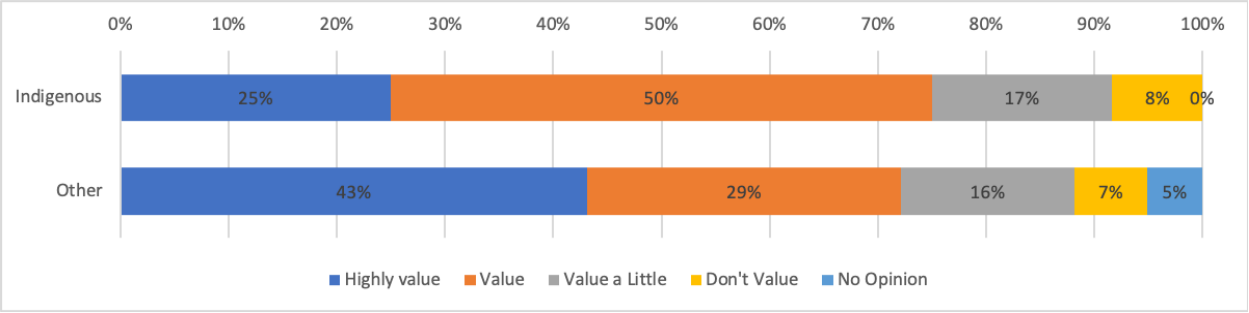


Figure 186: Valuation of the following factor given an increase in the federal budget: Increasing eligibility time of awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1080).

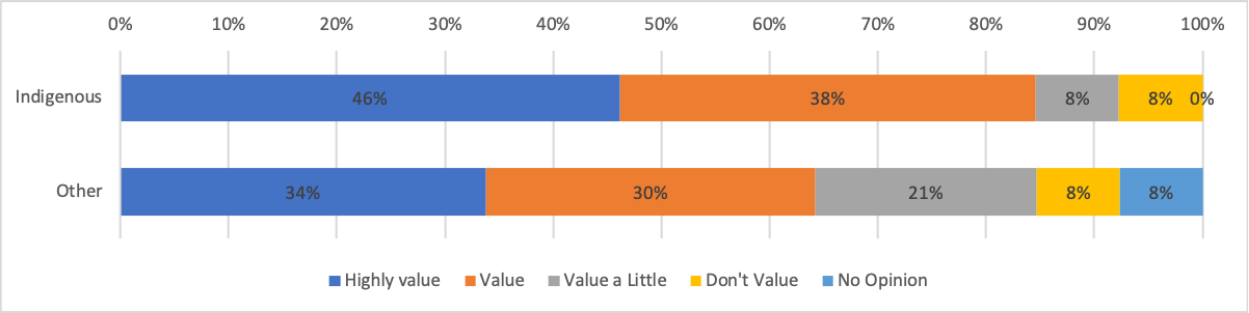


Figure 187: Valuation of the following factor given an increase in the federal budget: Increasing the number of interdisciplinary awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1078).

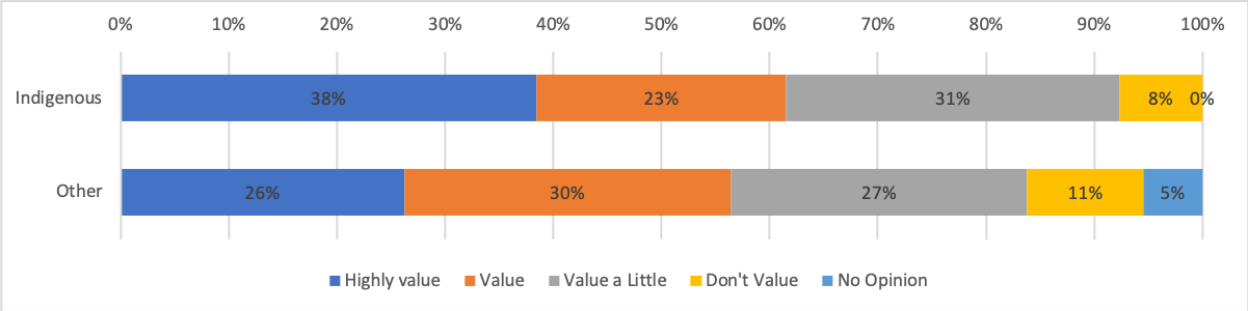


Figure 188: Valuation of the following factor given an increase in the federal budget: Increasing the number of travel awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1075).

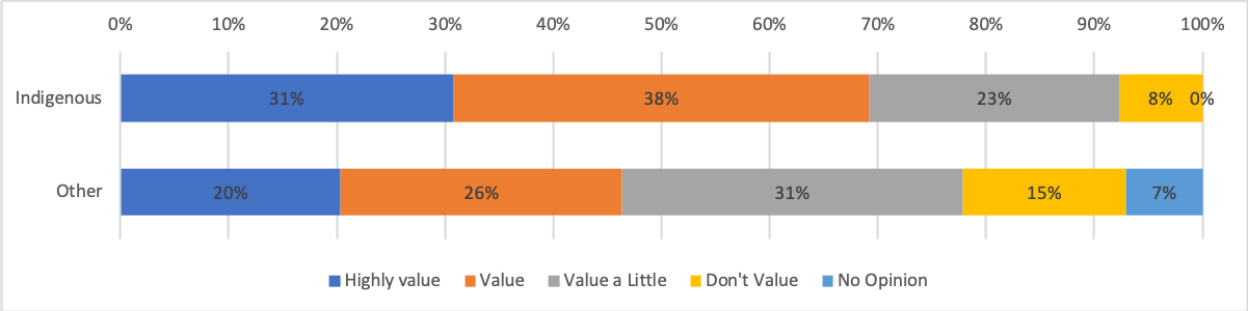


Figure 189: Valuation of the following factor given an increase in the federal budget: Increasing value of travel awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1065). (figure on previous page)

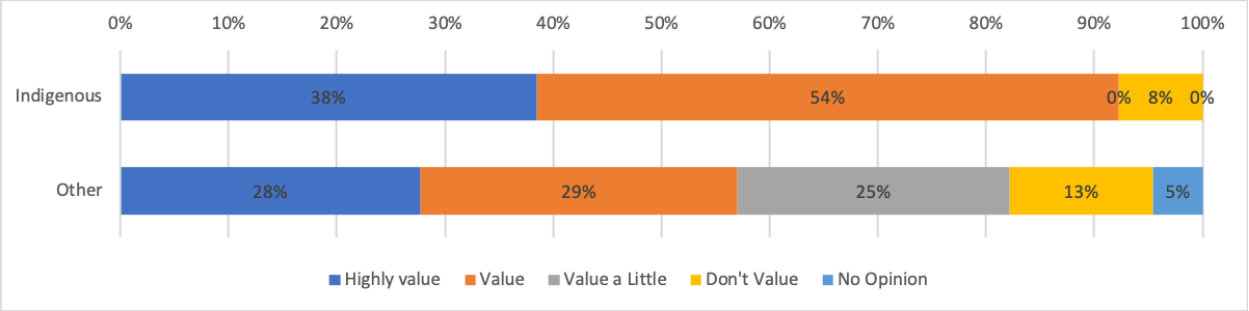


Figure 190: Valuation of the following factor given an increase in the federal budget: Increasing awards for outreach/engagement activities. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1072).

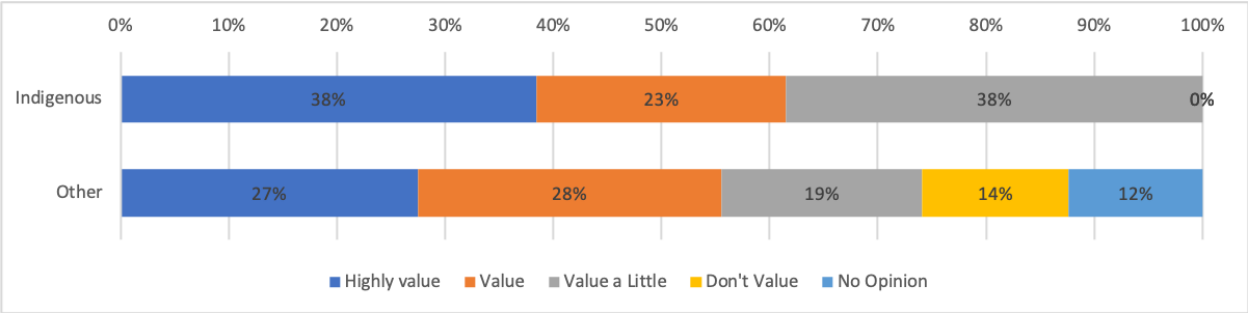


Figure 191: Valuation of the following factor given an increase in the federal budget: Harmonizing value amount of awards across CIHR, NSERC, SSHRC. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1070).

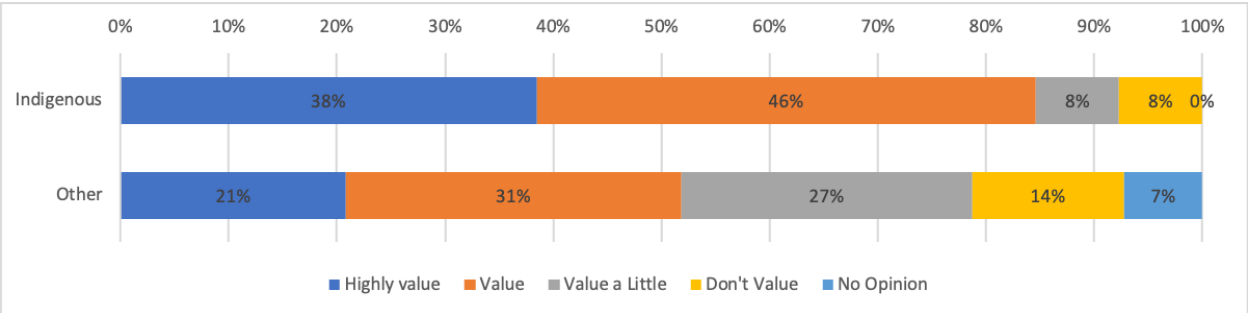


Figure 192: Valuation of the following factor given an increase in the federal budget: Including skills or impact-oriented activities as criteria for evaluation for all awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 13, n = 1084).

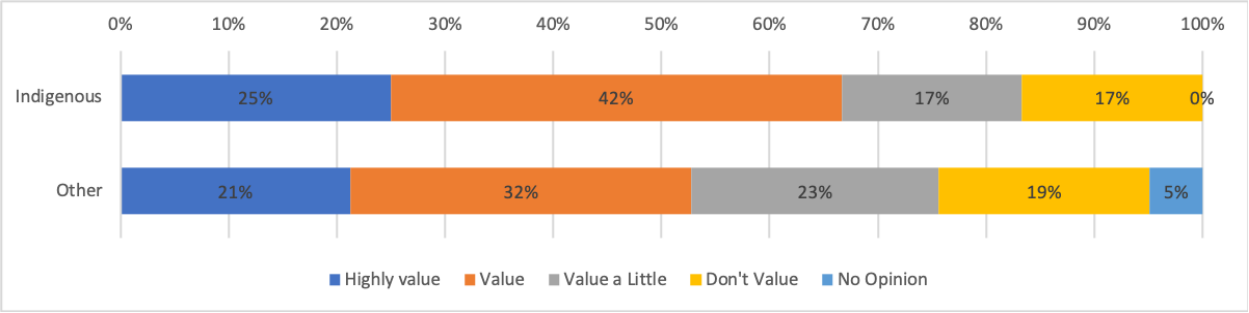


Figure 193: Valuation of the following factor given an increase in the federal budget: Including reports to be filled out by awardees at the end of the award to track outcomes. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 12, n = 1072).

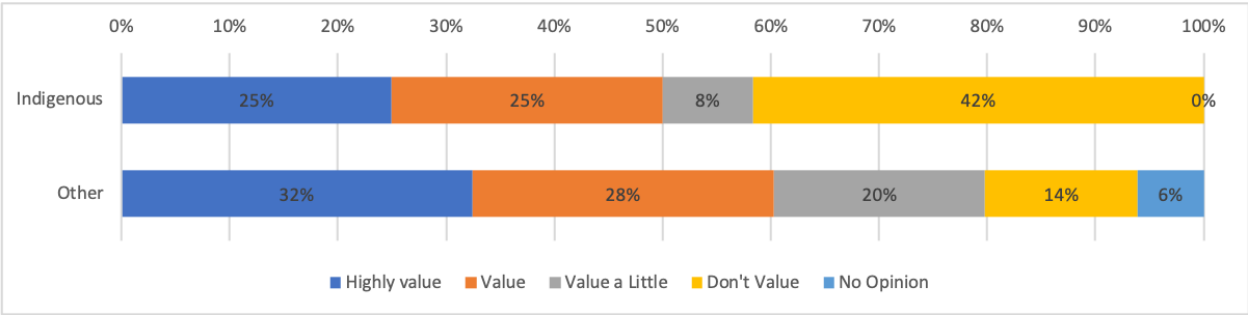


Figure 194: Valuation of the following factor given an increase in the federal budget: Include funding for peripheral support. Respondents were asked to indicate how much they value the above factor if there were an increase in the total federal budget for graduate and postdoctoral awards (n = 12, n = 1071). Peripheral support may include health/dental benefits, EI/CPP, etc.

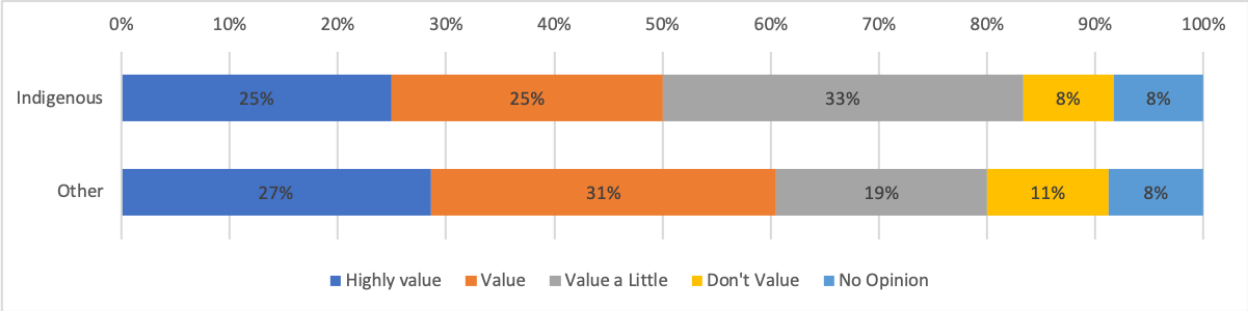


Figure 195: Valuation of the following factor given an increase in the federal budget: More support for awardees with dependents. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 12, n = 1119).

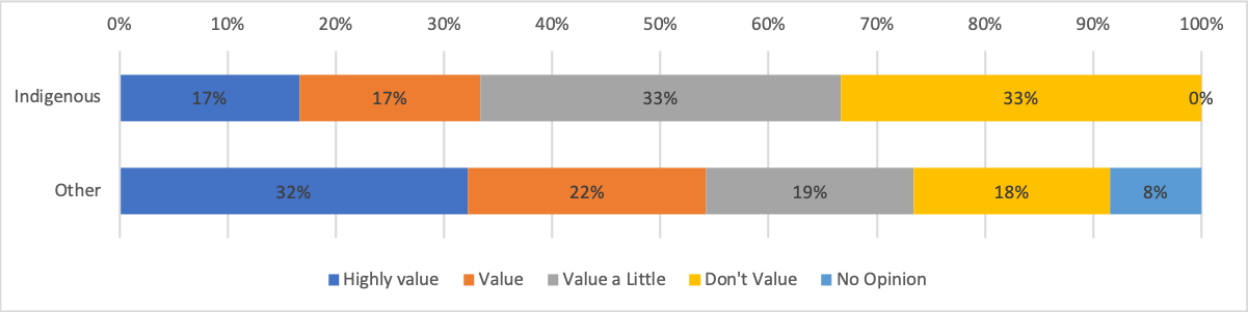


Figure 196: Valuation of the following factor given an increase in the federal budget: Increasing the number of awards open to international applicants. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 12, n = 1075).

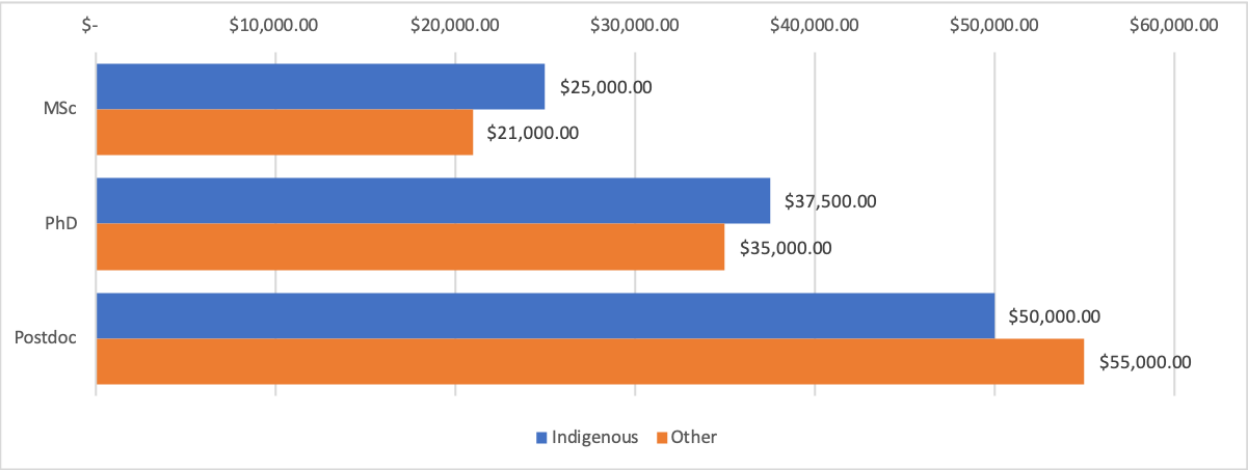


Figure 197: Recommended value of federal awards by level of study. Respondents were asked to generate ideal award values given inflation and the present costs of living in university towns, given there was an increase in the federal budget (n = 5, n = 688). Median values are reported.

Conclusions

Indigenous communities and their knowledge have a crucial role in Canadian political, social and economic landscapes. Supporting Indigenous students and postdoctoral fellows in their academic research contributes to the facilitation of cultural understanding by institutions, provides insightful collaborative opportunities, and represents important steps as the government seeks to achieve Reconciliation. Nearly half of Indigenous respondents report not receiving sufficient support in compiling an application as a barrier for applying to fellowships, whereas 3 in 10 cite limited considerations for equity, diversity and inclusion. It is important for the Canadian government to value and support Indigenous ECRs for their current contributions to research and as the leaders in research and community engagement of tomorrow.

Over three quarters of Indigenous ECRs value increasing the number of interdisciplinary awards. Often multidisciplinary projects also contain core components for field research and travel. As such, 7 in 10 Indigenous respondents value increasing the value of travel awards. The vast majority of Indigenous respondents agree that fellowships should prepare recipients for diverse careers, including those that are not academic in nature. Specifically, Indigenous respondents value policy

skills and second language training being built into a studentship or fellowship. Over half of Indigenous respondents strongly support including funding for both leadership training and communication training to diverse audiences in their fellowships. These variances in skill valuation, supported in the rest of the survey, show that different populations seek to use their academic research training to achieve diverse professional and personal goals. To this end, we recommend increasing the number of awards for interdisciplinary awards, and amending award criteria to include extracurricular activities, travel, and outreach work.

Inclusivity in science can help break down the barriers that are impeding Indigenous researchers from pursuing post-graduate education and will encourage local scientists to take the lead. Improving self-determination in research would help create meaningful collaborations with Indigenous communities. The next generation of Indigenous researchers needs support, funding, and training to allow these relationships to continue to develop.

Chapter VI: Citizenship-based Perspectives

Introduction

We aim to identify unique experiences and challenges within the international student population, specifically those surrounding international award accessibility, immigration procedures and auxiliary support. While many studies have evaluated challenges for international students to integrate within Canadian universities[9][10], we heard directly from them about the unique barriers for graduate students and postdoctoral students with respect to federal funding. Our cohort includes 765 Canadian citizens, 67 permanent residents and 279 international trainees.

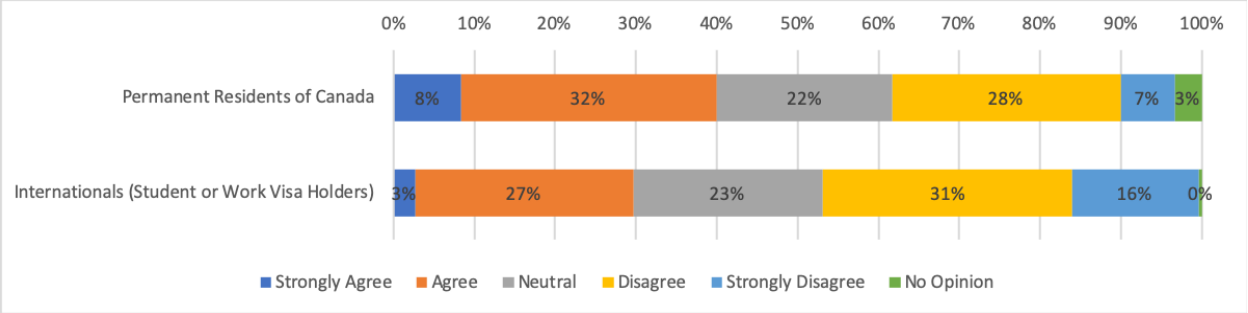


Figure 198: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Information on awards for international students/postdocs is easily accessible*. Reported by percent (n = 65, n = 277).

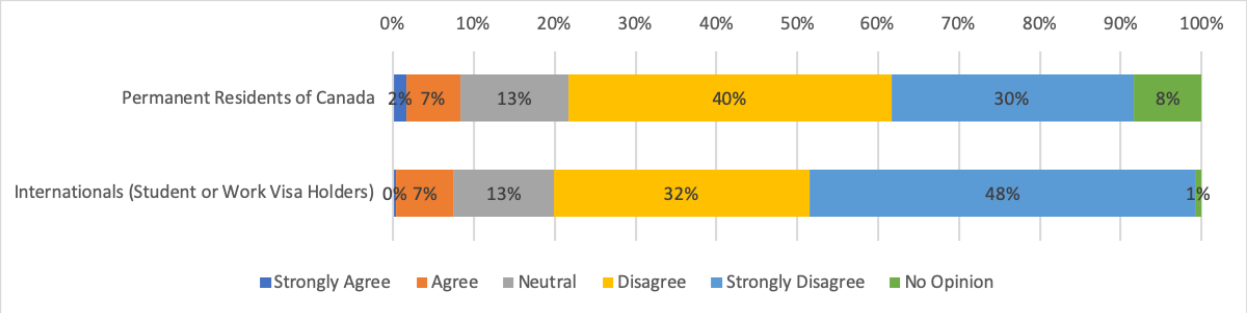


Figure 199: Agreement of international respondents with the following statement regarding their funding experience or immigration: *There are an adequate number of awards for international students/postdocs*. Reported by percent (n = 65, n = 277).

[9] Calder, Moira J., et al. "International Students Attending Canadian Universities: Their Experiences with Housing, Finances, and Other Issues." *Canadian Journal of Higher Education* 46.2 (2016): 92-110.
[10] Canadian Alliance of Student Associations / L'Alliance canadienne des associations étudiantes: "Value Beyond the Dollars and Cents: International Students' Contributions to Canada and Their Need for Supports". https://www.casa-acae.com/value_beyond_the_dollars_and_cents_international_students_contributions_to_canada_and_their_need_for_supports.

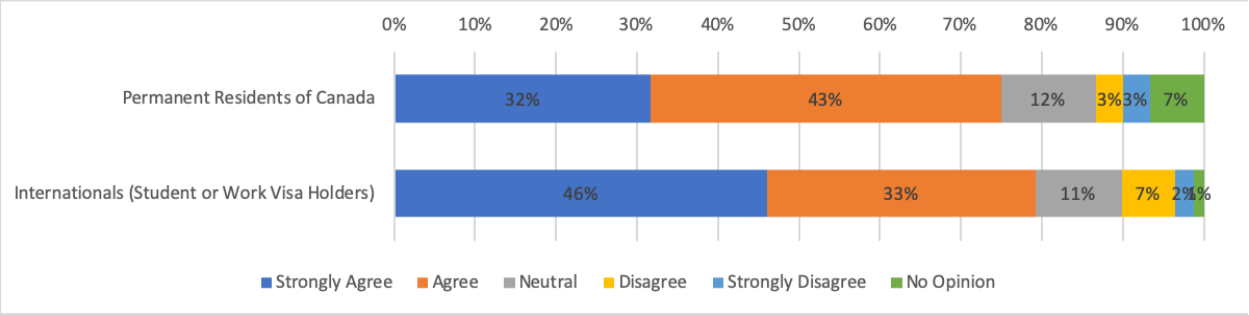


Figure 200: Agreement of international respondents with the following statement regarding their funding experience or immigration: *There are not enough awards for international students/postdocs*. Reported by percent (n = 65, n = 277).

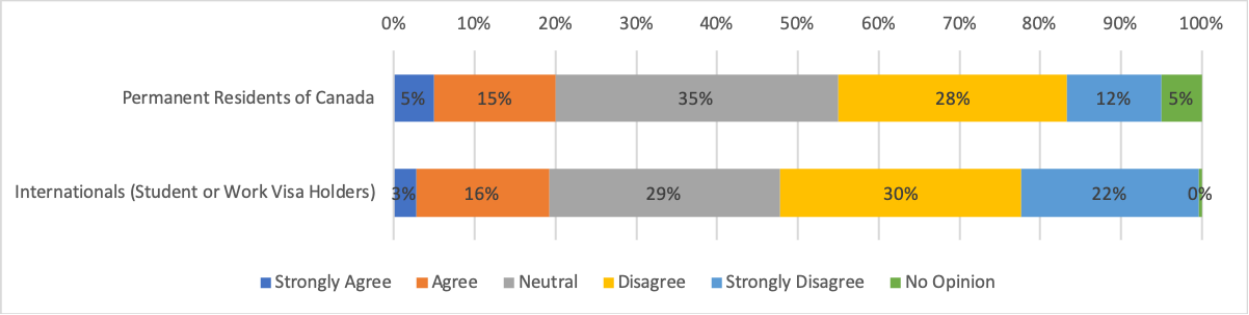


Figure 201: Agreement of international respondents with the following statement regarding their funding experience or immigration: *There are adequate resources to help access and apply for awards for international students/postdocs*. Reported by percent (n = 65, n = 275).

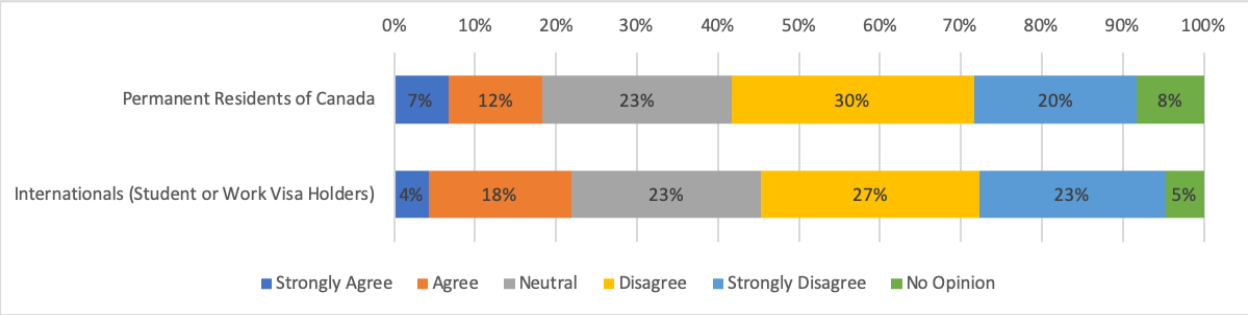


Figure 202: Agreement of international respondents with the following statement regarding their funding experience or immigration: *The value of awards is adequate.* Reported by percent (n = 65, n = 277).

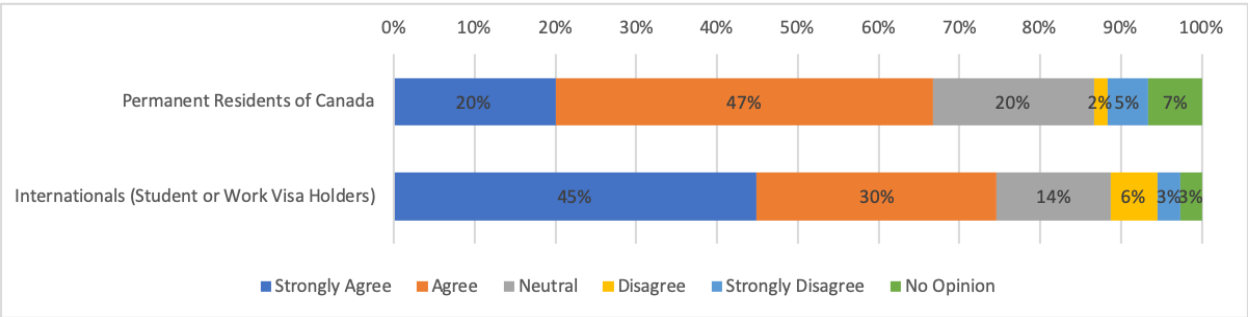


Figure 203: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Specific incentives for international students are lacking*. Incentives include specific awards, specific reduction of certain taxes, etc. Reported by percent (n = 65, n = 277). (figure on previous page)

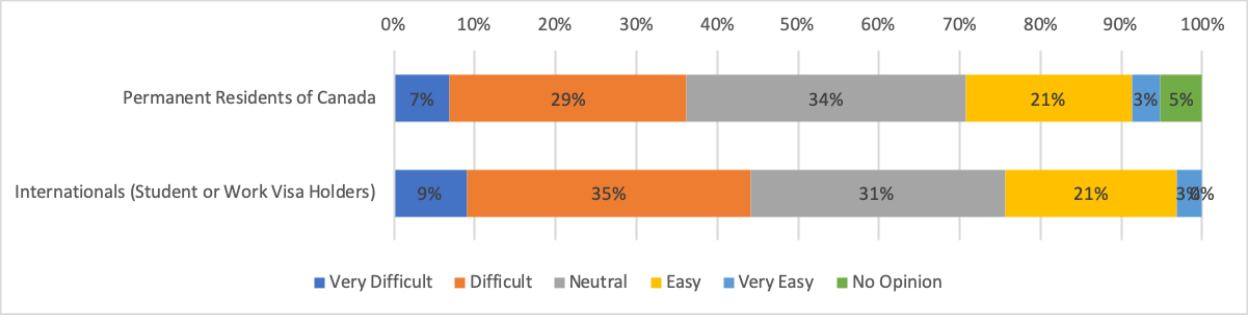


Figure 204: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Finding reliable information specific for international students/postdocs.* Reported by percent (n = 63, n = 275).

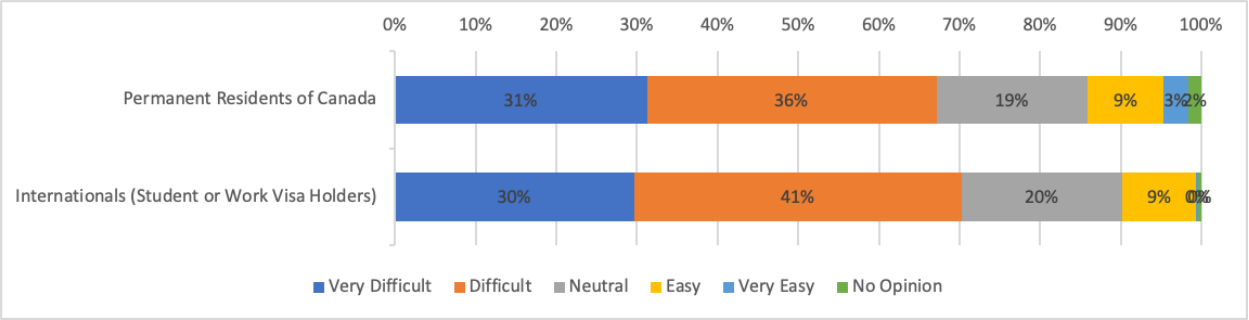


Figure 205: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Finding funding.* Reported by percent (n = 64, n = 276).

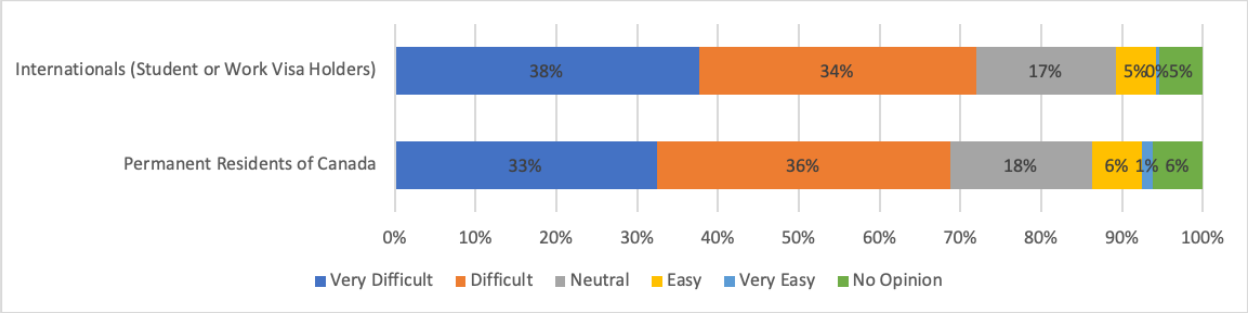


Figure 206: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Applying for federal awards.* Reported by percent (n = 64, n = 276).

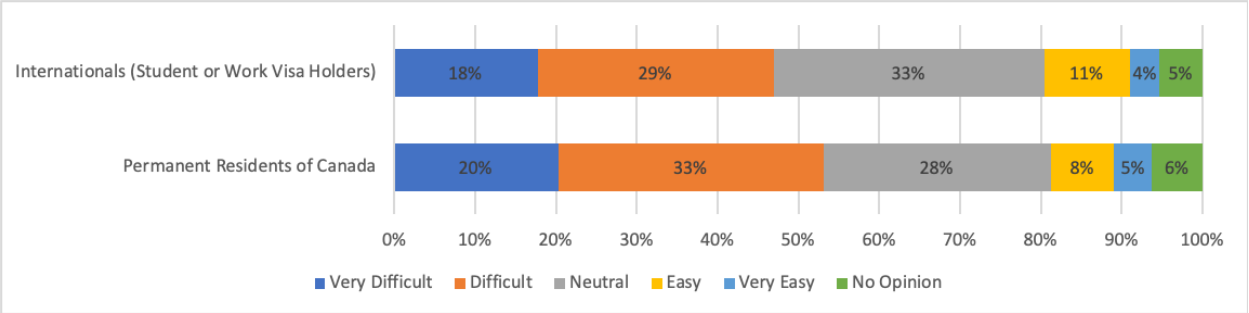


Figure 207: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Being competitive (criteria of research excellence in Canadian awards is different from country(ies) where previously studied).* Reported by percent (n = 64, n = 276).

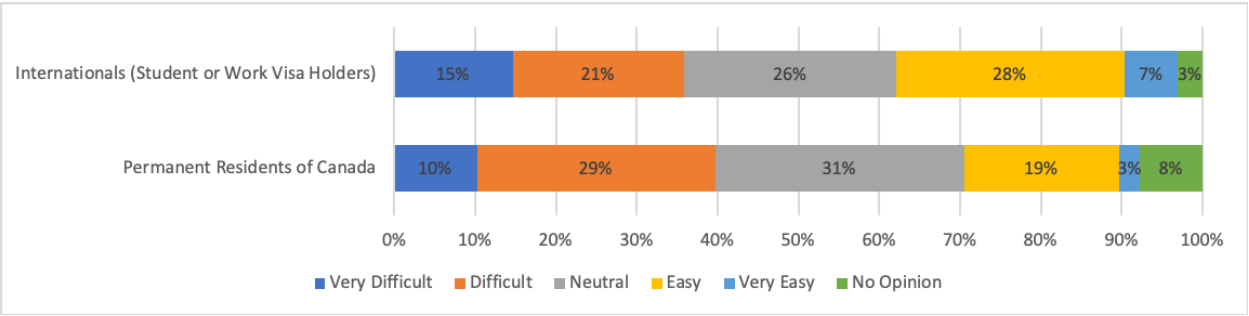


Figure 208: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Immigration procedures.* Reported by percent (n = 64, n = 276).

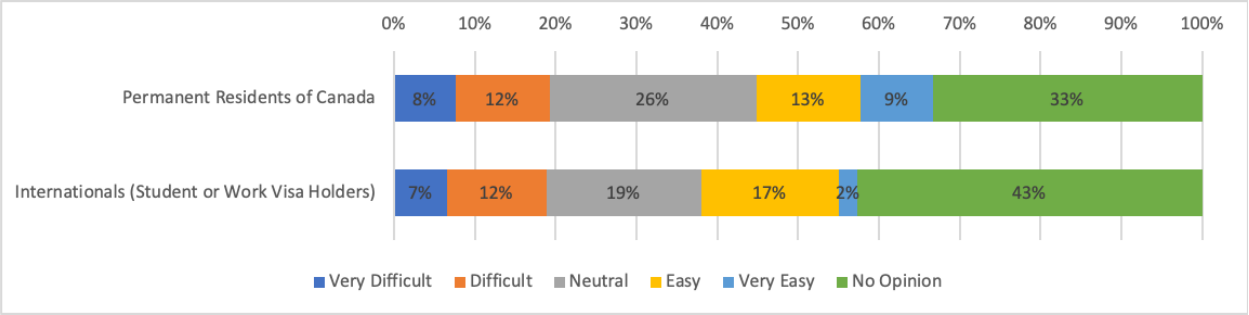


Figure 209: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Bringing spouse/partner/dependents (immigration issues).* Reported by percent (n = 64, n = 276).

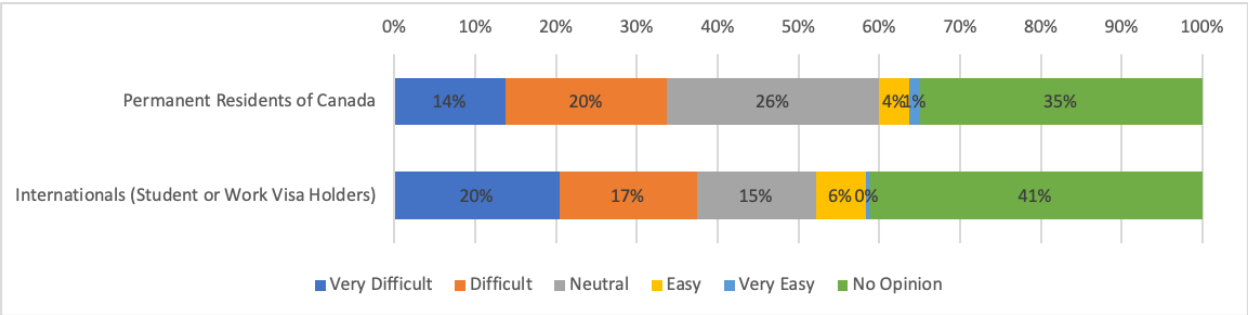


Figure 210: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Ability to support dependents once arrived.* Reported by percent (n = 64, n = 275). (figure on previous page)

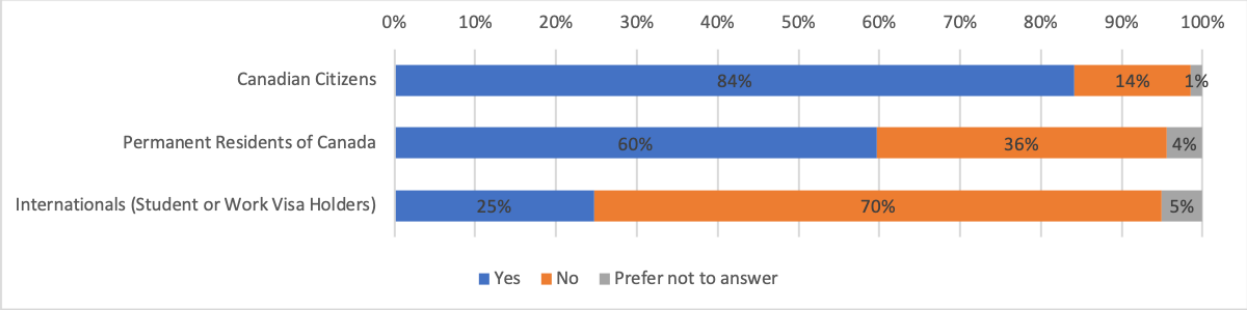


Figure 211: *Have you ever applied for a graduate or postdoctoral fellowship through CIHR, NSERC, or SSHRC?* (n = 765, n = 67, n = 279).

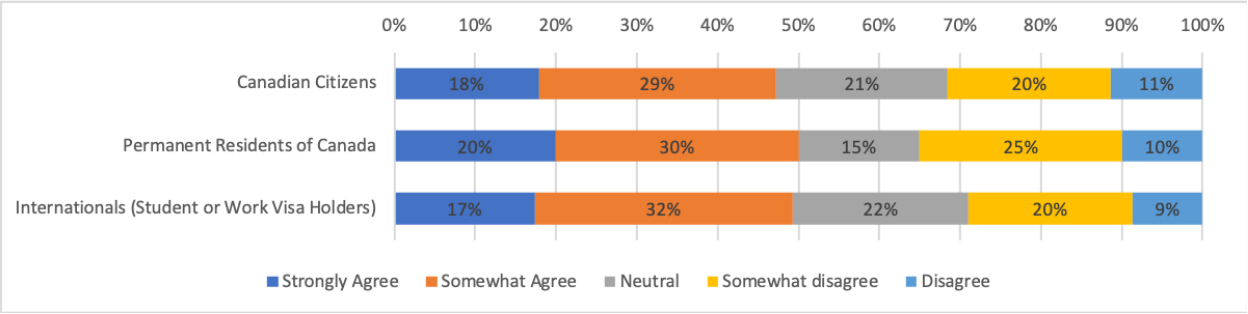


Figure 212: *Please state to what degree you agree with the following statement: I received adequate resources to help me complete my application.* Respondents who applied for a federal grant were asked to state their agreeance with the above statement (n = 644, n = 40, n = 69).

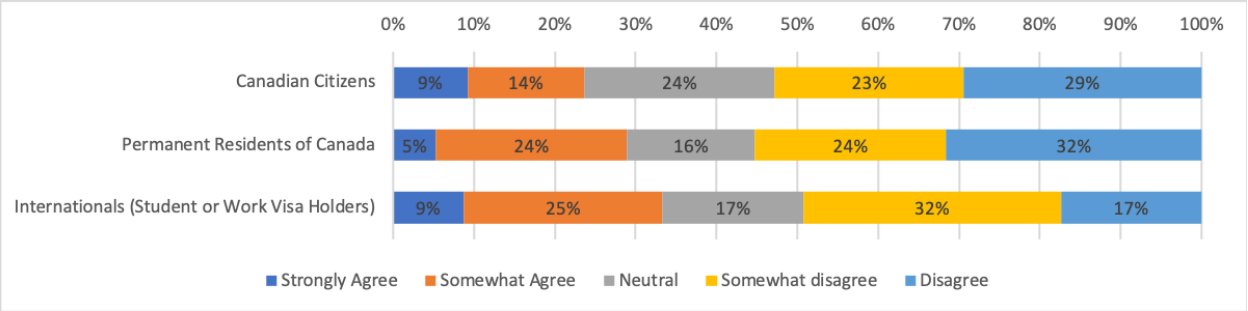


Figure 213: *Please state to what degree you agree with the following statement: I received useful feedback from my application, whether or not it was successful?* Respondents who applied for a federal grant were asked to state their agreeance with the above statement (n = 642, n = 38, n = 69).

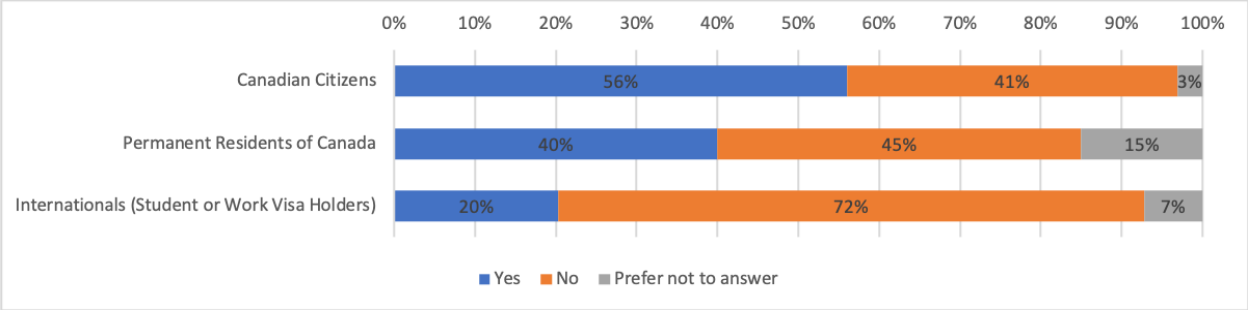


Figure 214: *Were any of your application(s) successful?* Respondents who applied for a federal grant were asked to state if their application was successful (n = 644, n = 40, n = 69).

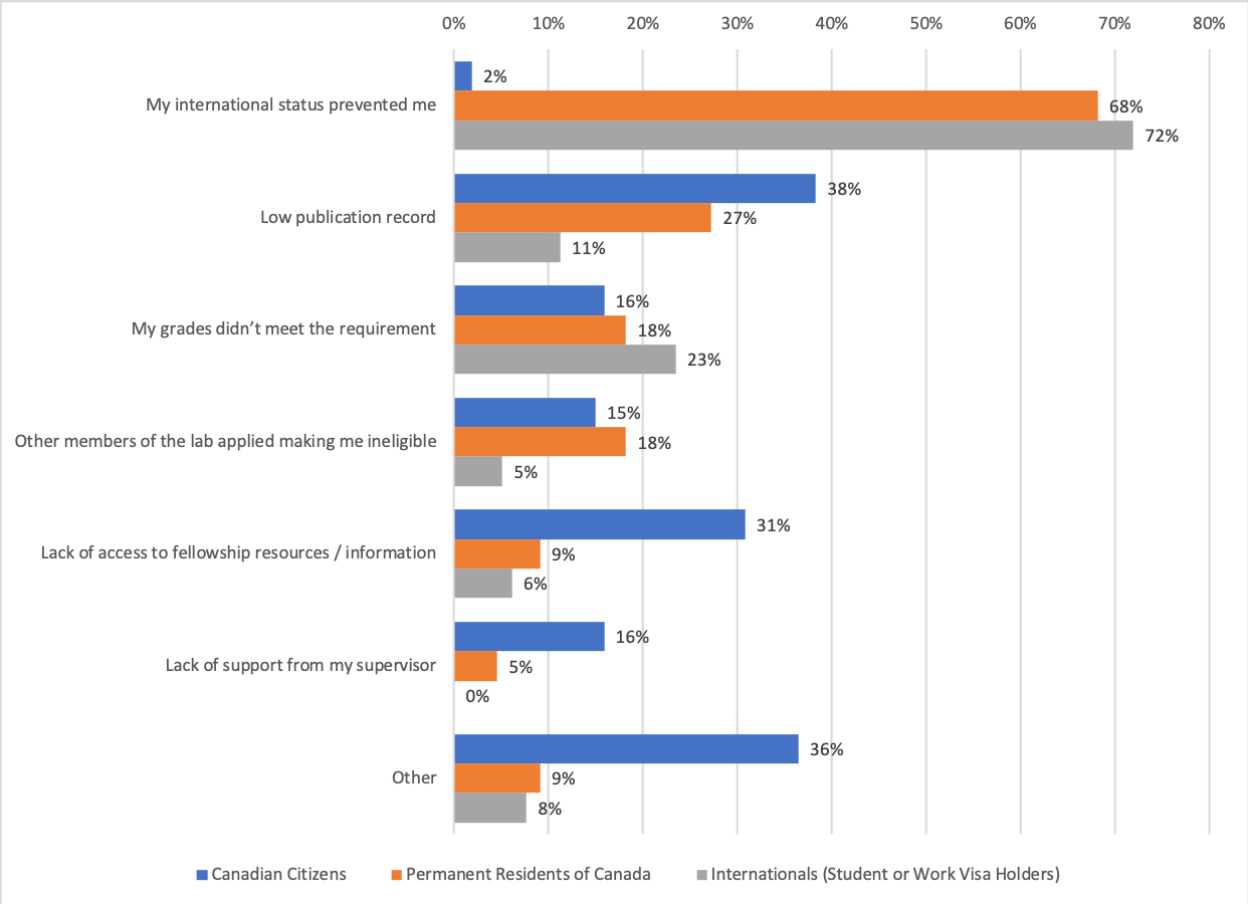


Figure 215: *What prevented you from applying?* Respondents were asked to indicate the reason that prevented them from applying for fellowships/scholarships. (n = 165, n = 34, n = 246).

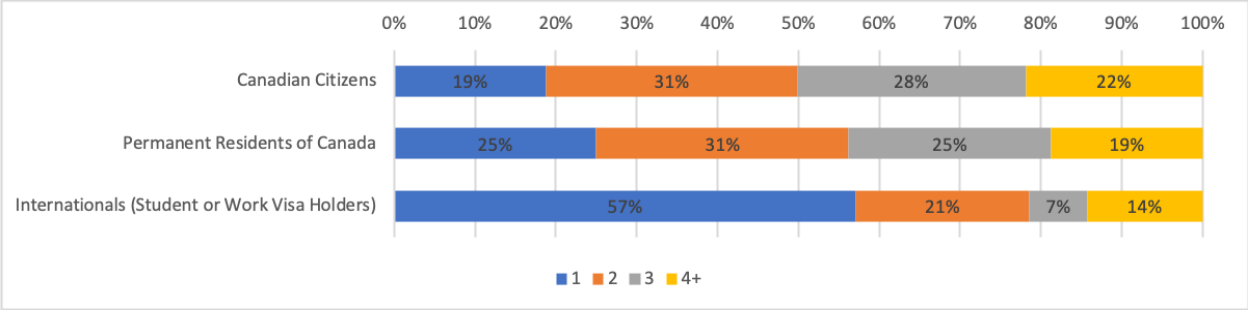


Figure 216: *How many federal fellowships/studentships have you applied for?* Successful awardees disclosed the number of federal grants to which they applied. (n = 361, n = 16, n = 14).

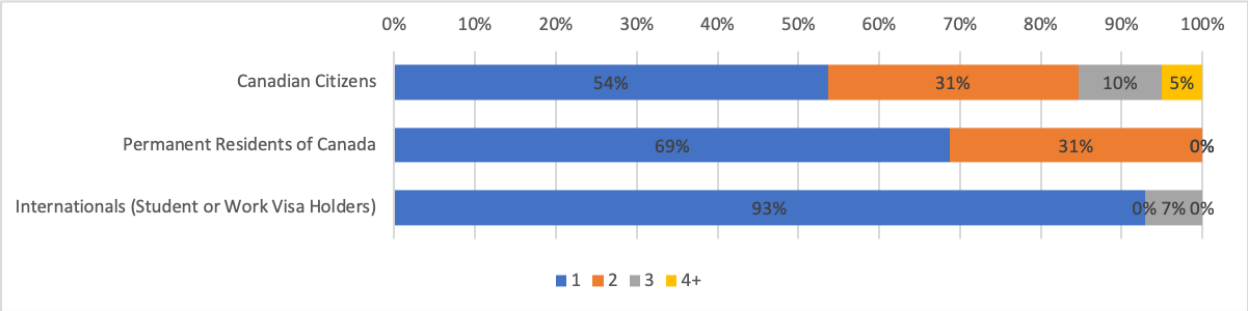


Figure 217: *How many of your federal fellowship/studentship applications have been successful?* Successful awardees disclosed the number of federal grants they received. (n = 358, n = 16, n = 14).

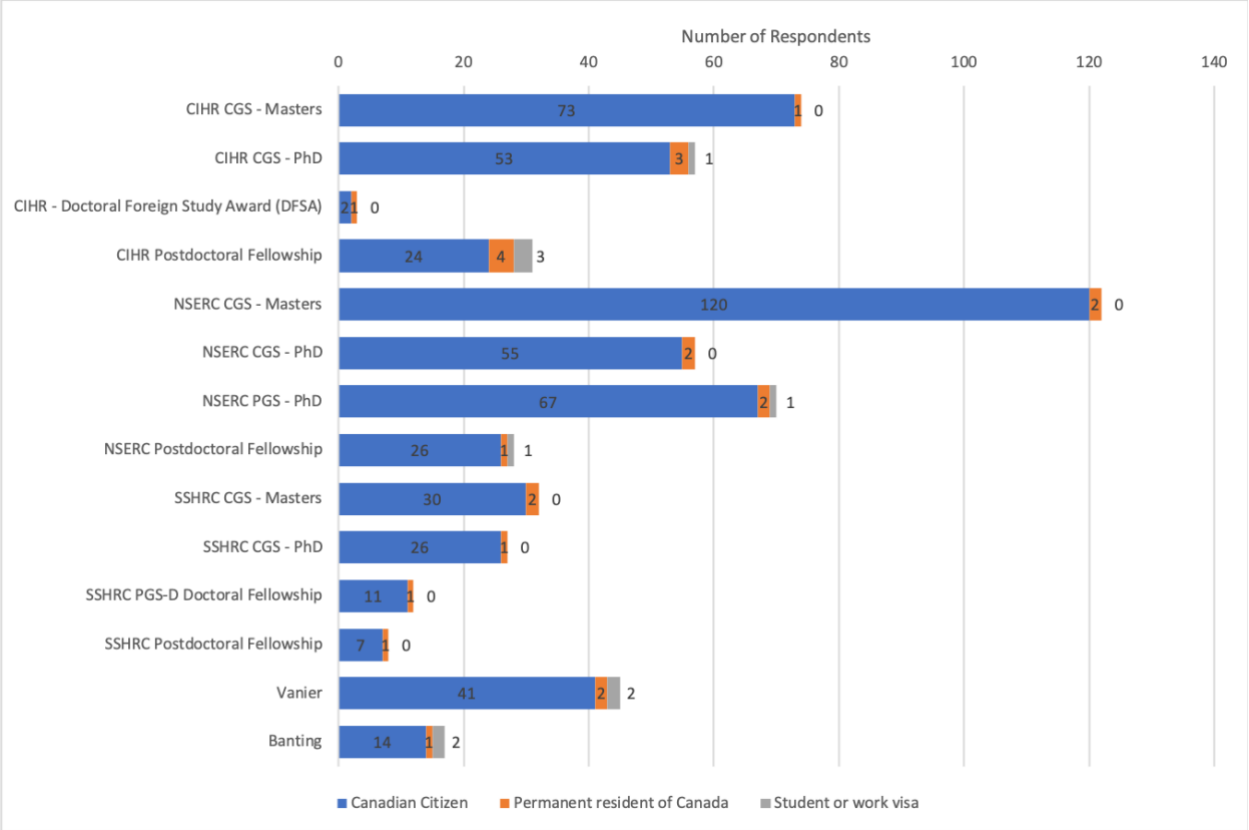


Figure 218: *Federal awards received.* Respondents noted which awards they successfully received, with more than one award per applicant possible (n = 358, n = 16, n = 13). (figure on previous page)

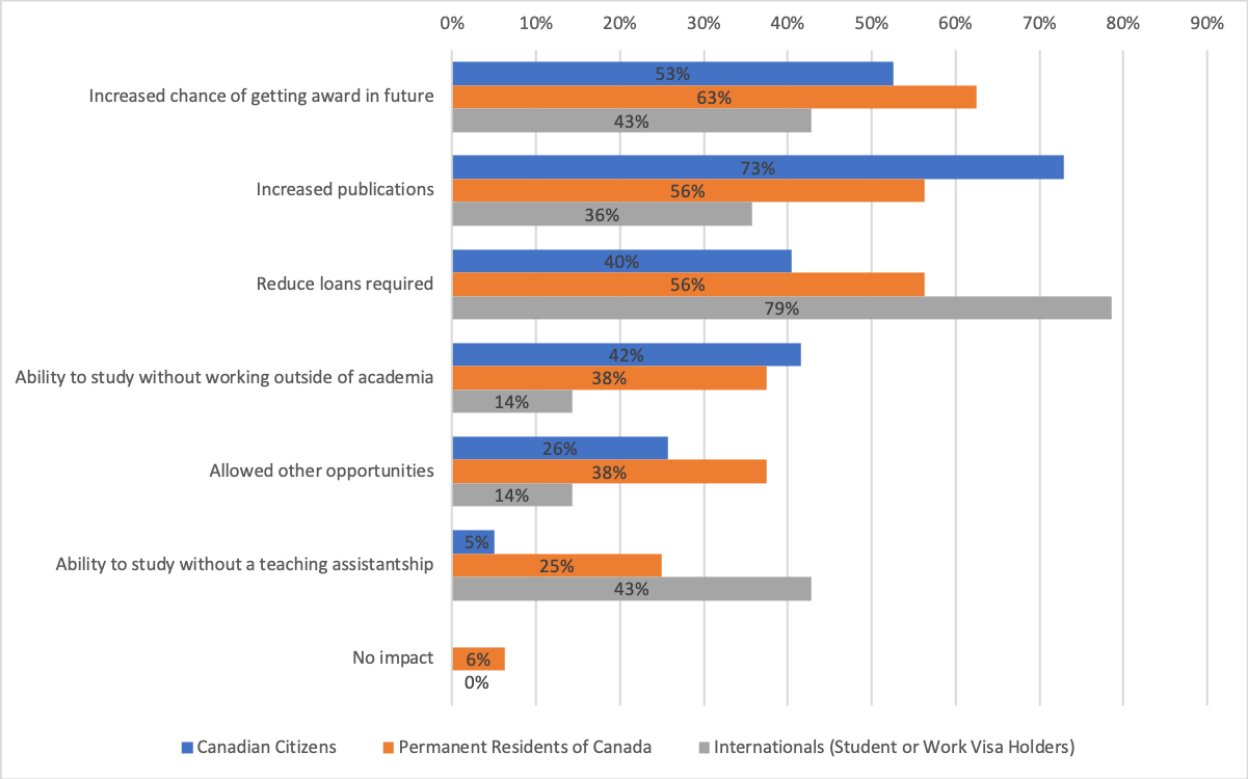


Figure 219: *What impact did receiving an award have on you and your research?* Benefits of receiving an award on successful awardees, by percent (n = 361, n = 16, n = 14). 4% of successful awardees cited no impact to their research environment, career or personal life.

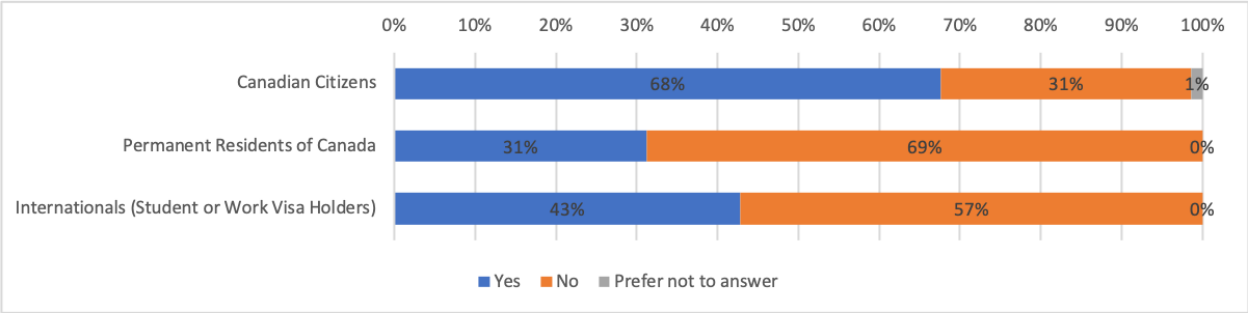


Figure 220: *Did you require other sources of funding during the duration of this award?* Percent of respondents who required other sources of funding while holding their award (n = 361, n = 16, n = 14).

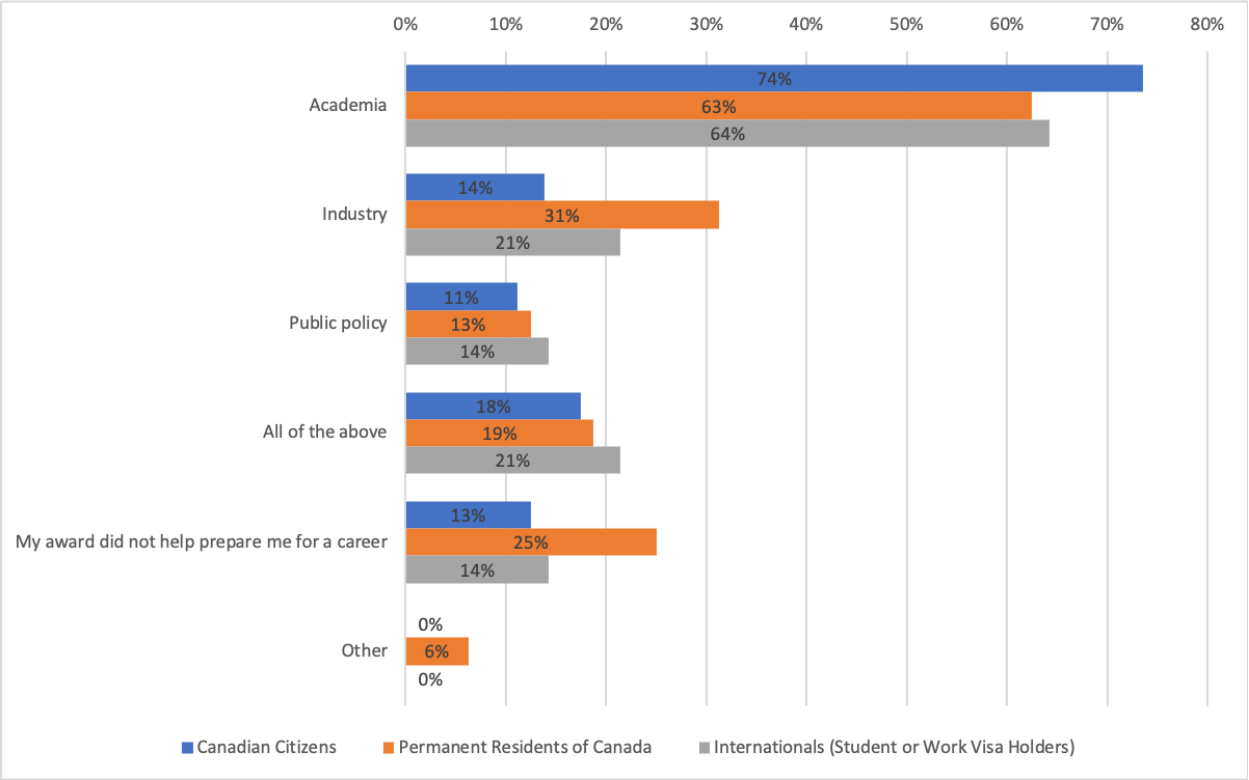


Figure 221: Assistance of federal awards towards diverse career preparation, by number of respondents. Trainees were asked to specify which career paths and industries their award helped them prepare for. Multiple answers possible. 337 respondents indicated that their award prepared them best for a career in academia (n = 360, n = 16, n = 13).

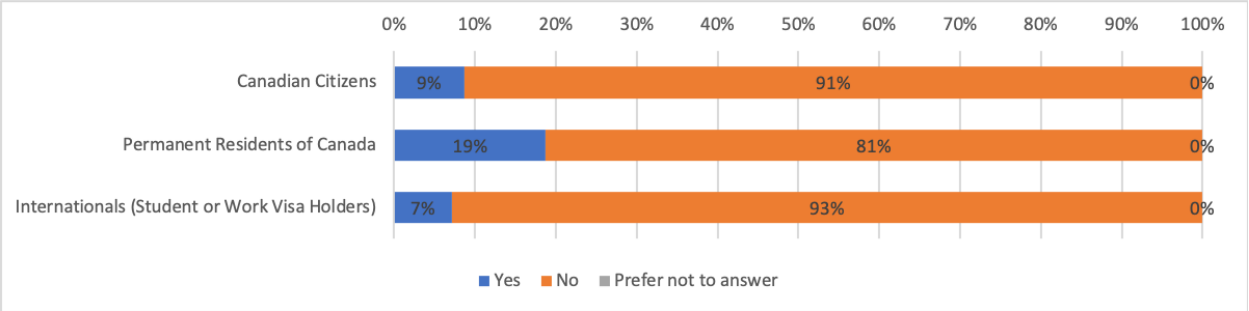


Figure 222: *Did receiving an award have a negative effect on your career or experience?* (n = 359, n = 16, n = 14).

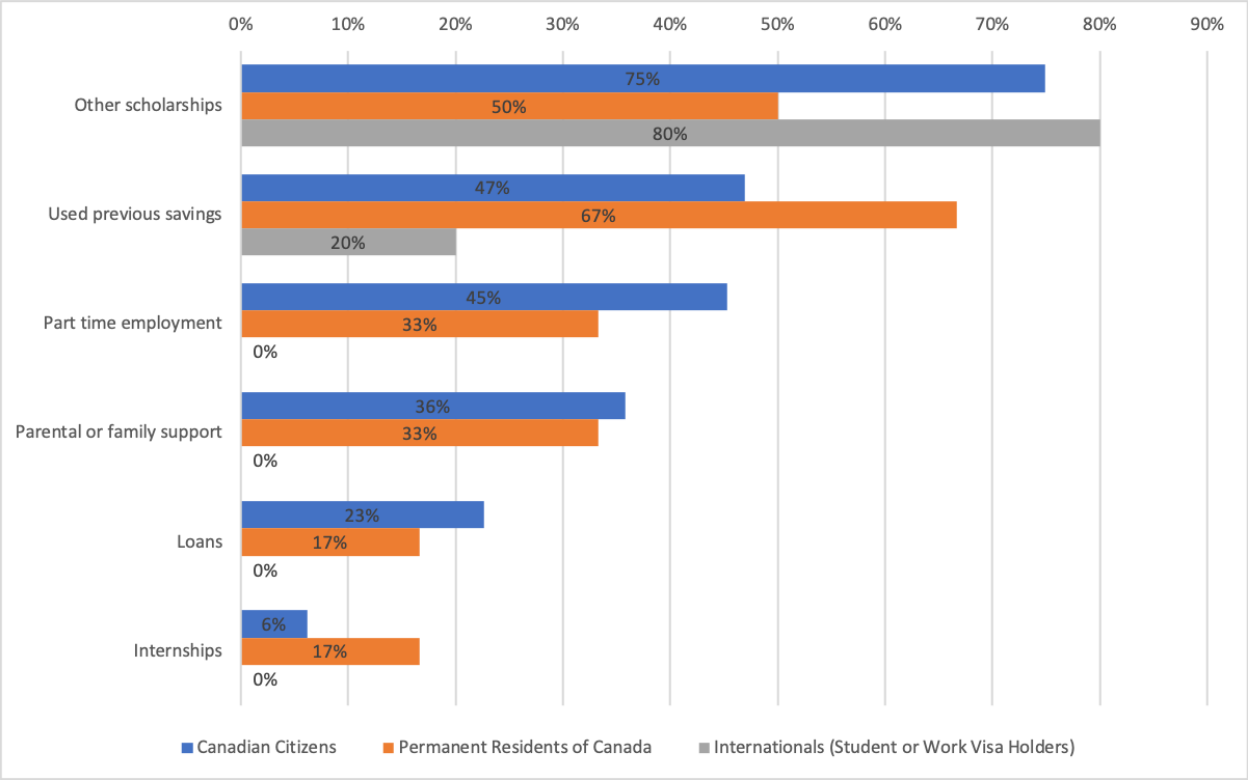


Figure 223: *For those who required other sources of funding during the duration of this award, what type of support did you seek/receive?* Respondents who answered in the affirmative for the above question noted the alternative support they received in addition to their award (n = 243, n = 6, n = 5).

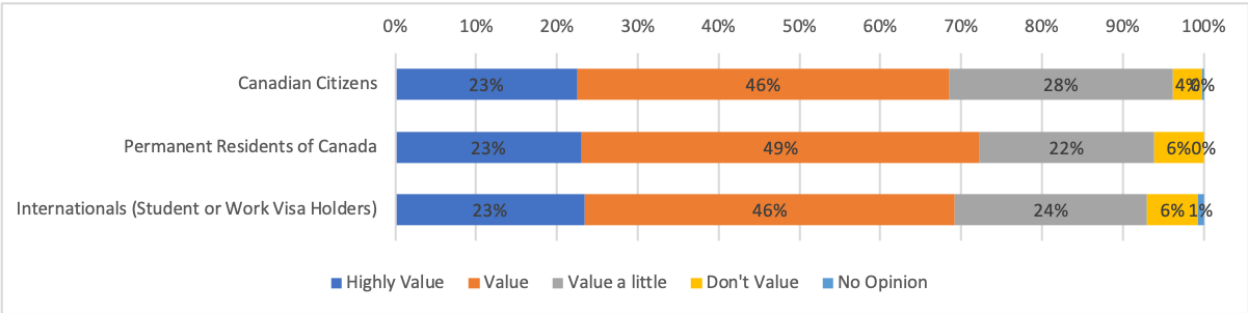


Figure 224: Ideal valuation of fellowship application criteria by reviewers: Academic record. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 759, n = 65, n = 273).

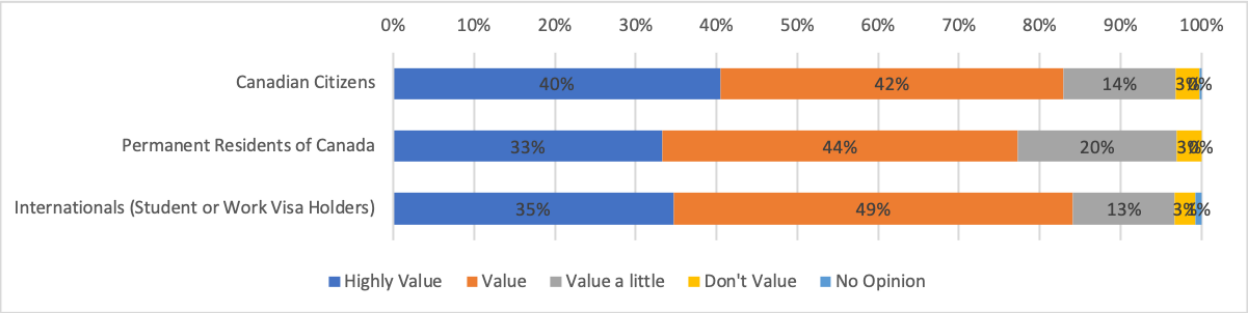


Figure 225: Ideal valuation of fellowship application criteria by reviewers: Research-related extracurricular involvement. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 753, n = 65, n = 277). (figure on previous page)

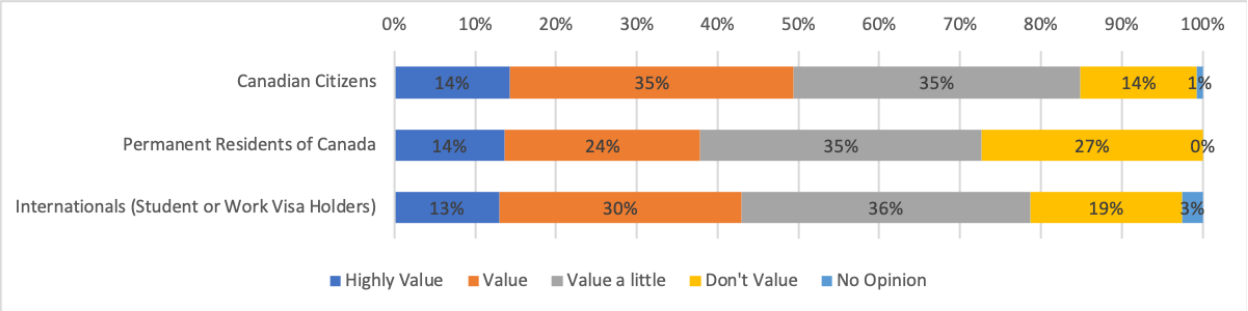


Figure 226: Ideal valuation of fellowship application criteria by reviewers: All other types of extracurricular involvement. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 761, n = 66, n = 277).

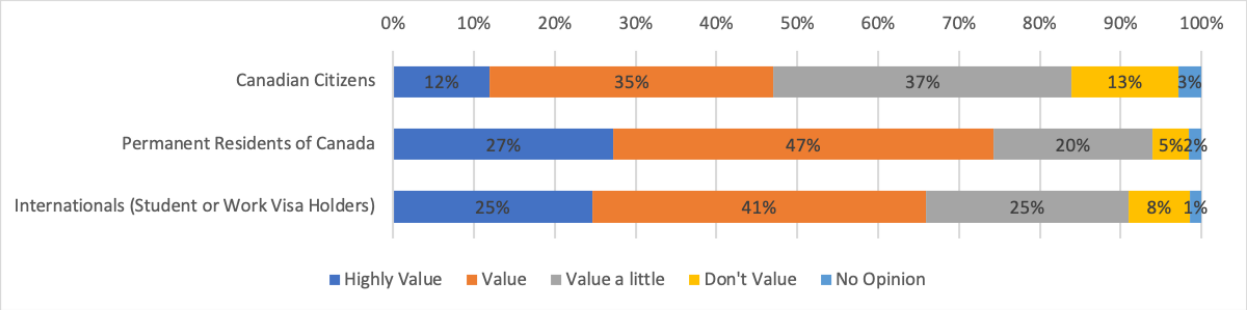


Figure 227: Ideal valuation of fellowship application criteria by reviewers: International collaboration. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 761, n = 66, n = 276).

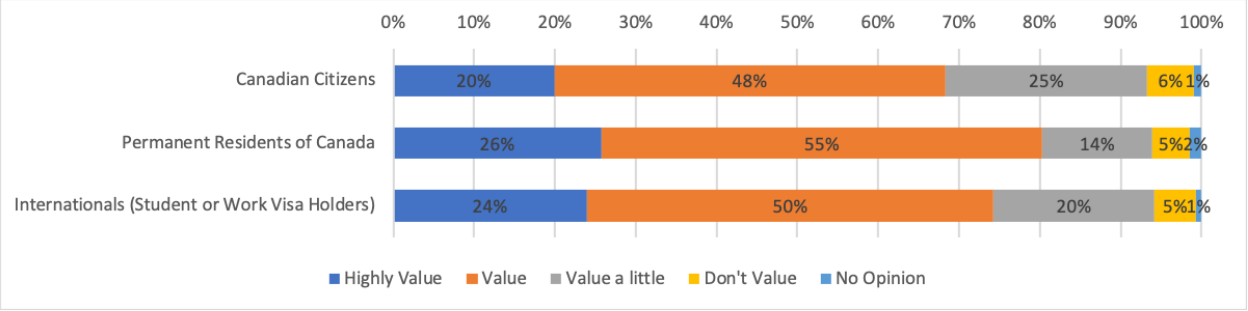


Figure 228: Ideal valuation of fellowship application criteria by reviewers: Mentorship activities. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 758, n = 66, n = 276).

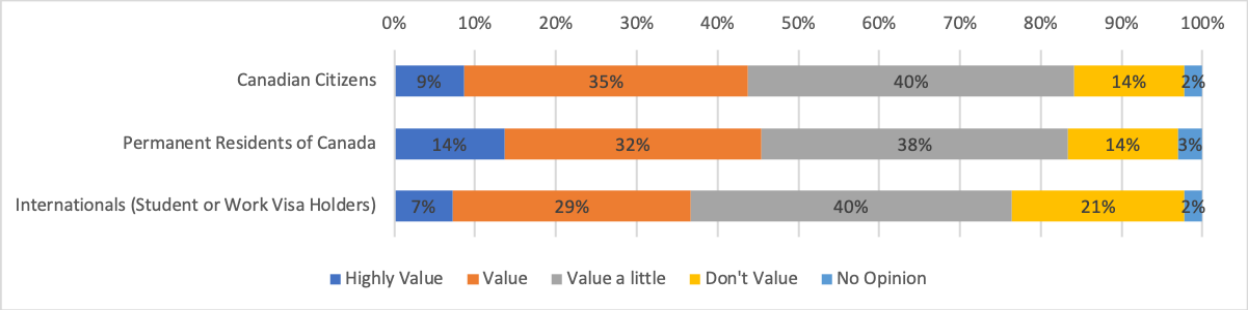


Figure 229: Ideal valuation of fellowship application criteria by reviewers: Non-academic publications. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 760, n = 66, n = 275). Non-academic publications may include books, op-eds, blogs, and white papers.

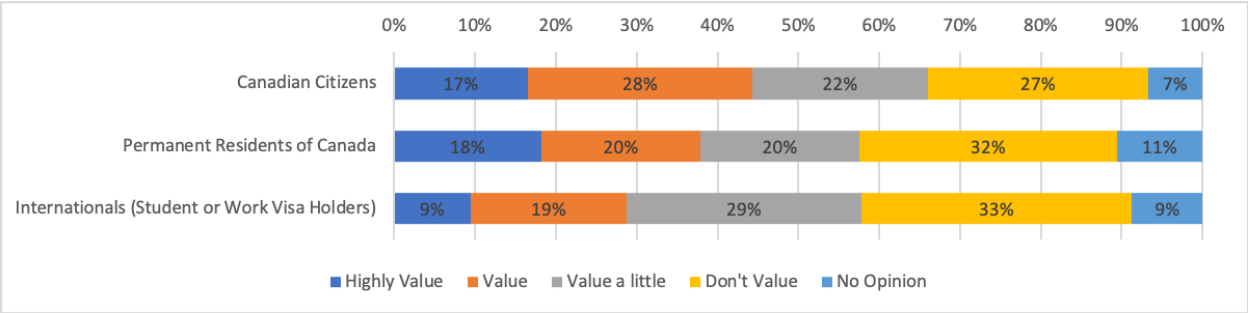


Figure 230: Ideal valuation of fellowship application criteria by reviewers: Periods of leave. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 762, n = 66, n = 275). Periods of leave include those for academic, parental, personal health, familial health, or other reasons.

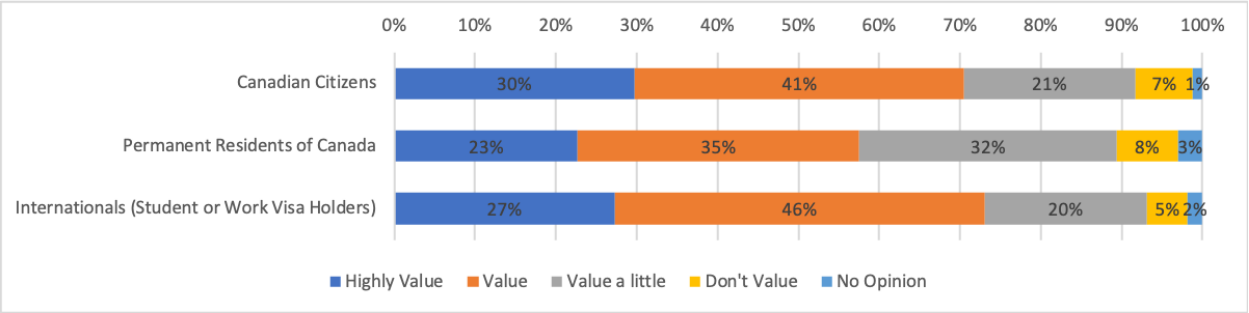


Figure 231: Ideal valuation of fellowship application criteria by reviewers: Potential societal impacts of the research. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 759, n = 66, n = 275).

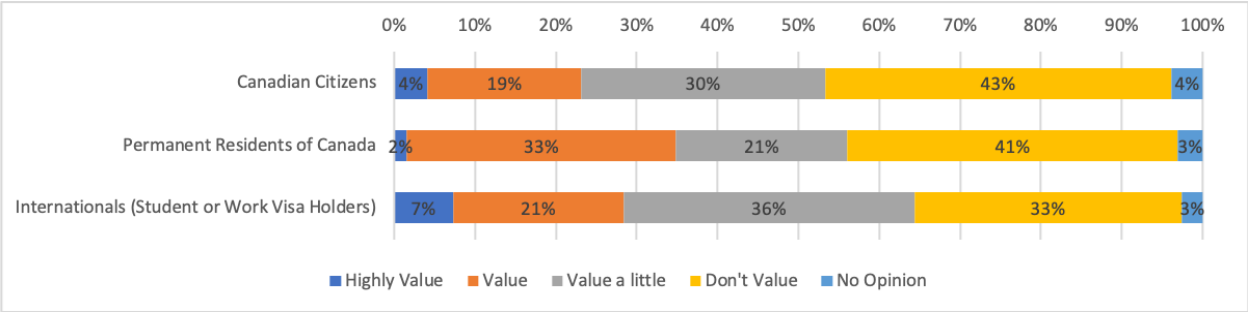


Figure 232: Ideal valuation of fellowship application criteria by reviewers: Prestige of the institution or of your supervisor. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 760, n = 66, n = 275).

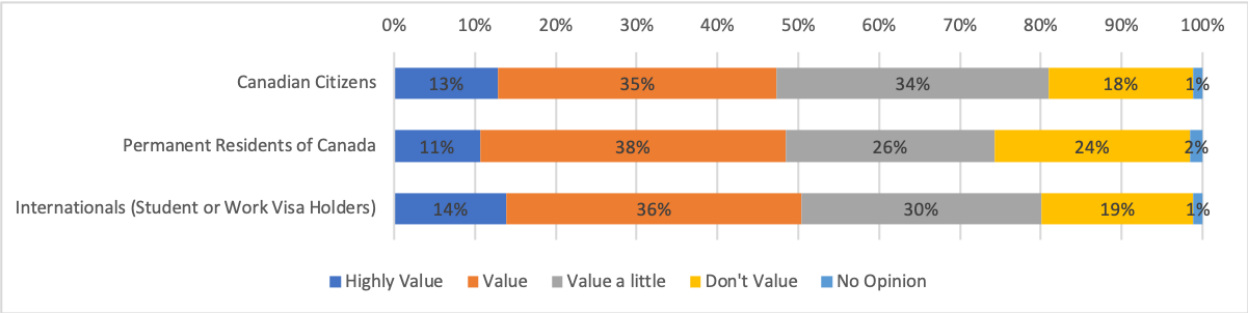


Figure 233: Ideal valuation of fellowship application criteria by reviewers: Previous success with awards (distinctions). Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 756, n = 66, n = 266).

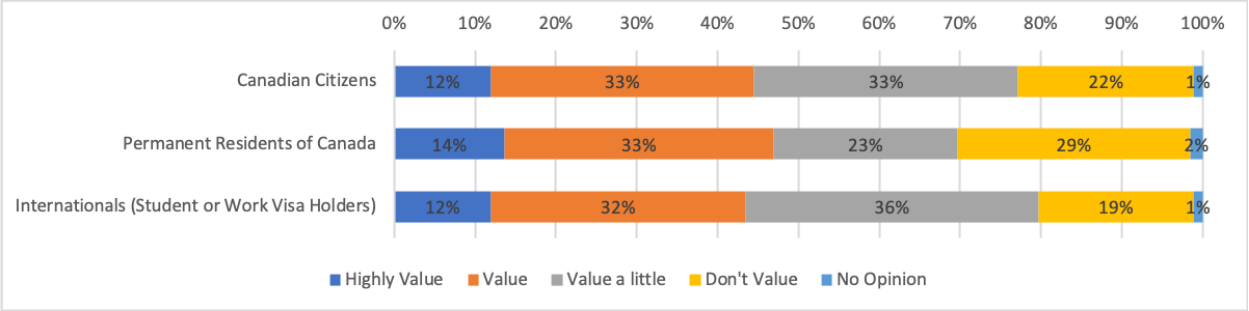


Figure 234: Ideal valuation of fellowship application criteria by reviewers: Previous success with scholarships and fellowships. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 763, n = 66, n = 276).

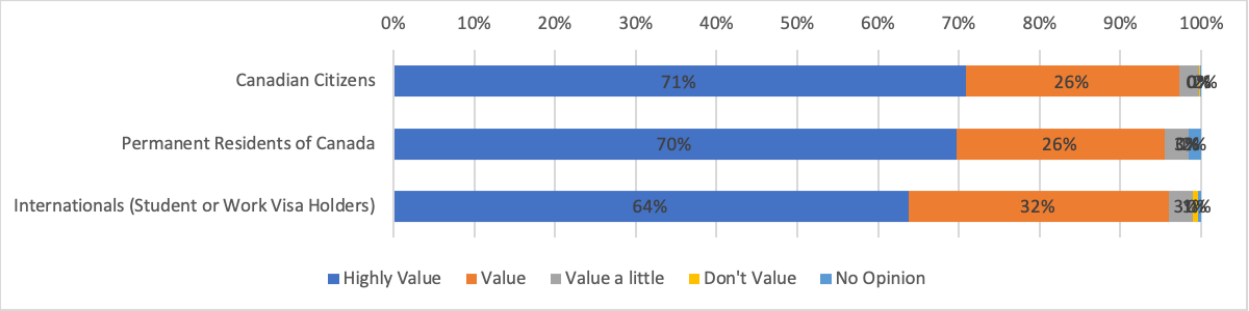


Figure 235: Ideal valuation of fellowship application criteria by reviewers: Project description / proposal. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 762, n = 66, n = 276). (figure on previous page)

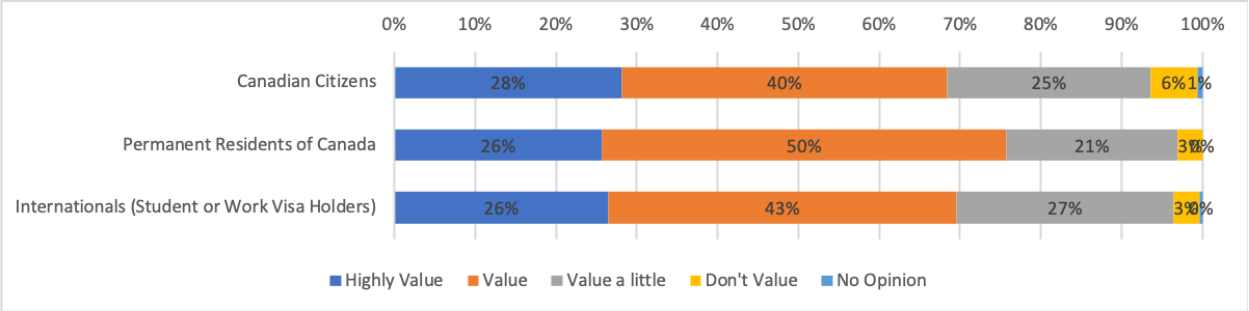


Figure 236: Ideal valuation of fellowship application criteria by reviewers: Publication record. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 763, n = 66, n = 276).

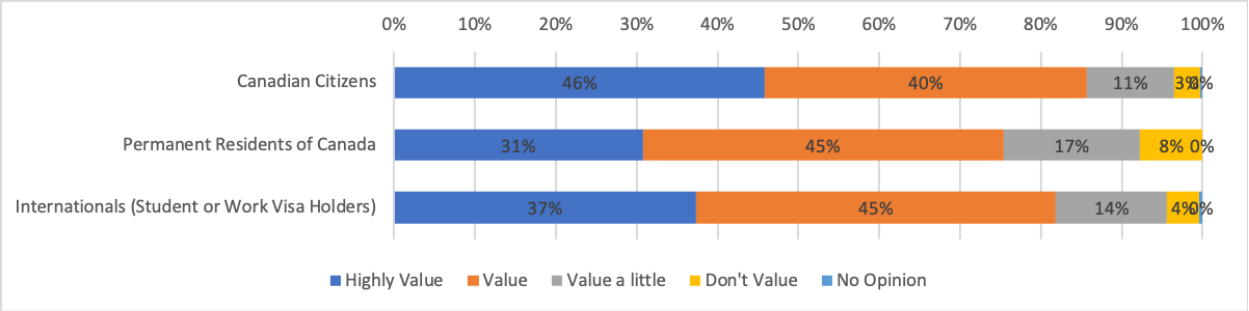


Figure 237: Ideal valuation of fellowship application criteria by reviewers: Reference letters. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 763, n = 65, n = 276).

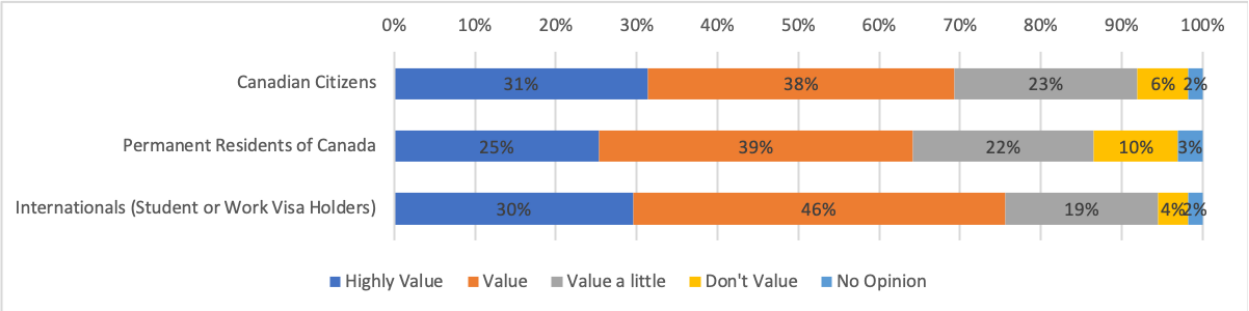


Figure 238: Ideal valuation of fellowship application criteria by reviewers: Societal importance of the challenge the research seeks to address. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 761, n = 67, n = 274).

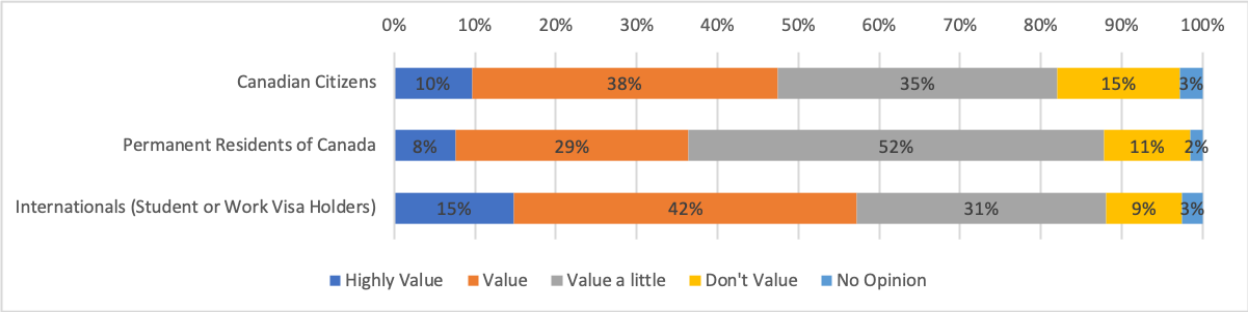


Figure 239: Ideal valuation of fellowship application criteria by reviewers: Teaching and TAship.. Respondents were asked to rate how much they believe reviewers should place value on the above factor when evaluating scholarship and fellowship applications (n = 761, n = 66, n = 276).

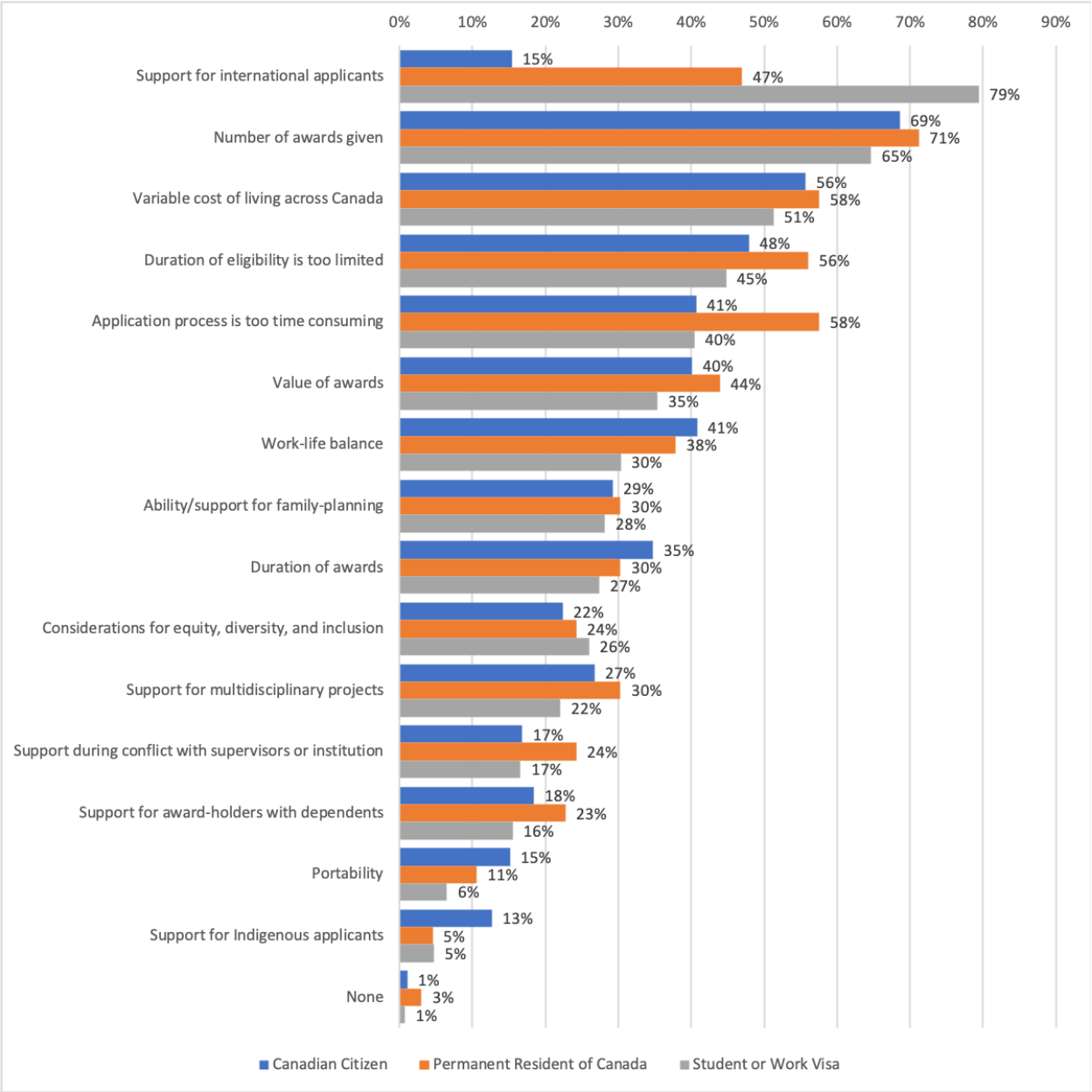


Figure 240: *What are the barriers or problems with current scholarship and fellowship opportunities?* Multiple selections possible (n = 765, n = 66, n = 277). (figure on previous page)

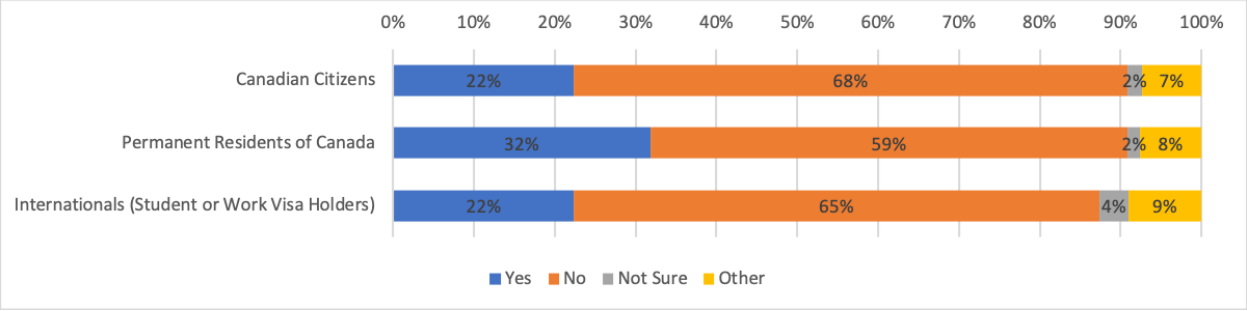


Figure 241: *Do you think your field of research is not adequately represented by the awards opportunities available from CIHR, NSERC, or SSHRC?* By percent (n = 765, n = 66, n = 277).

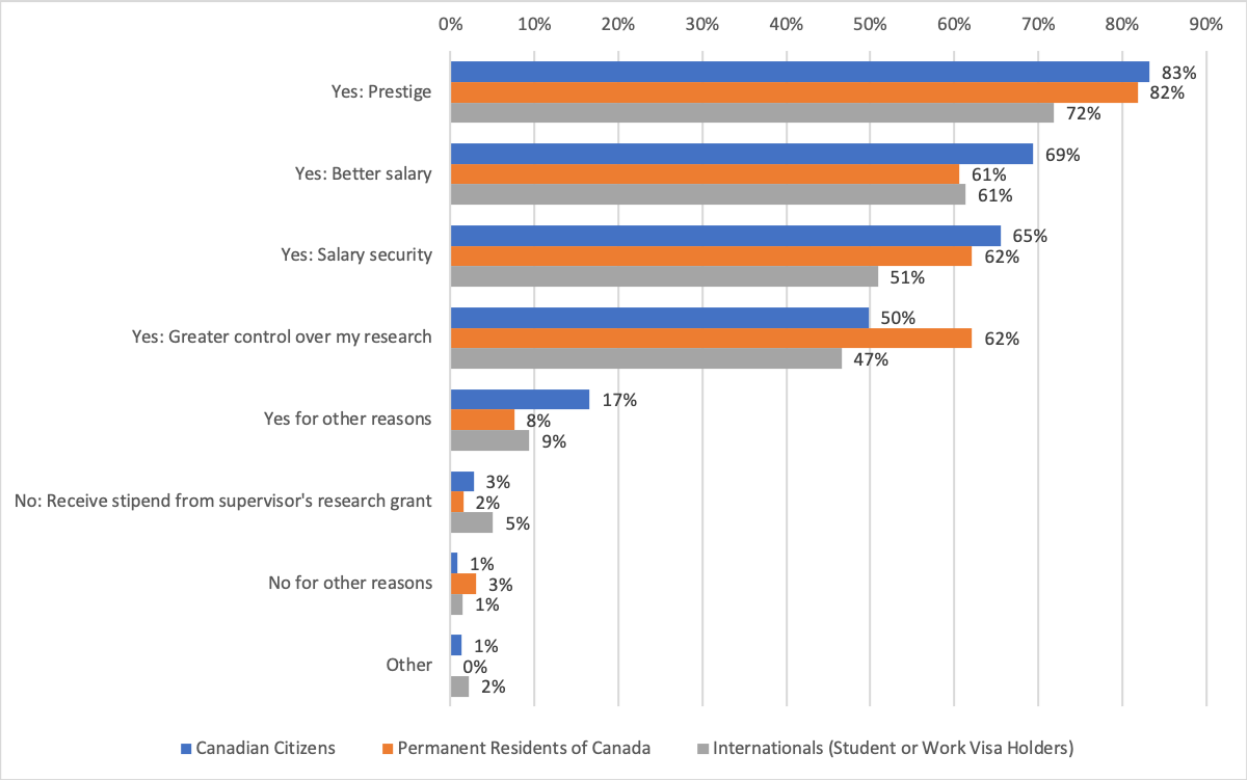


Figure 242: Benefits of obtaining funding from awards, rather than from supervisor's research grant, by percent (n = 765, n = 66, n = 277). Multiple selections possible.

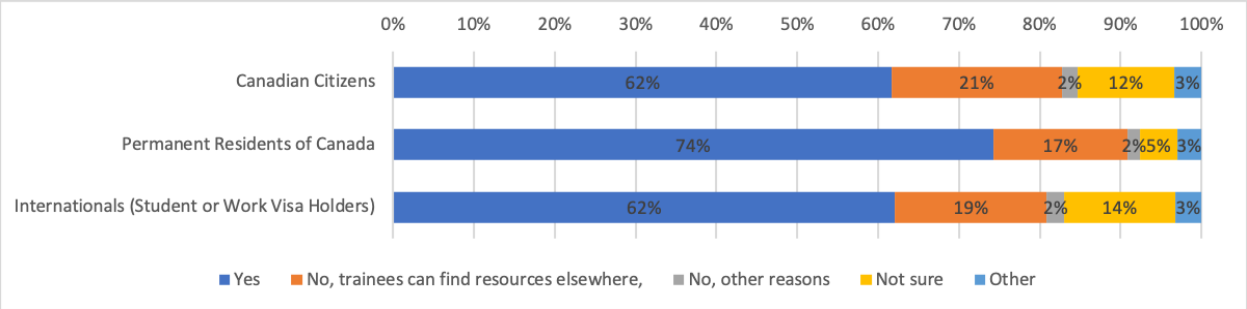


Figure 243: *Do you think that scholarships and fellowships should help to prepare trainees for diverse careers outside of academia?* By percent (n = 765, n = 66, n = 277).

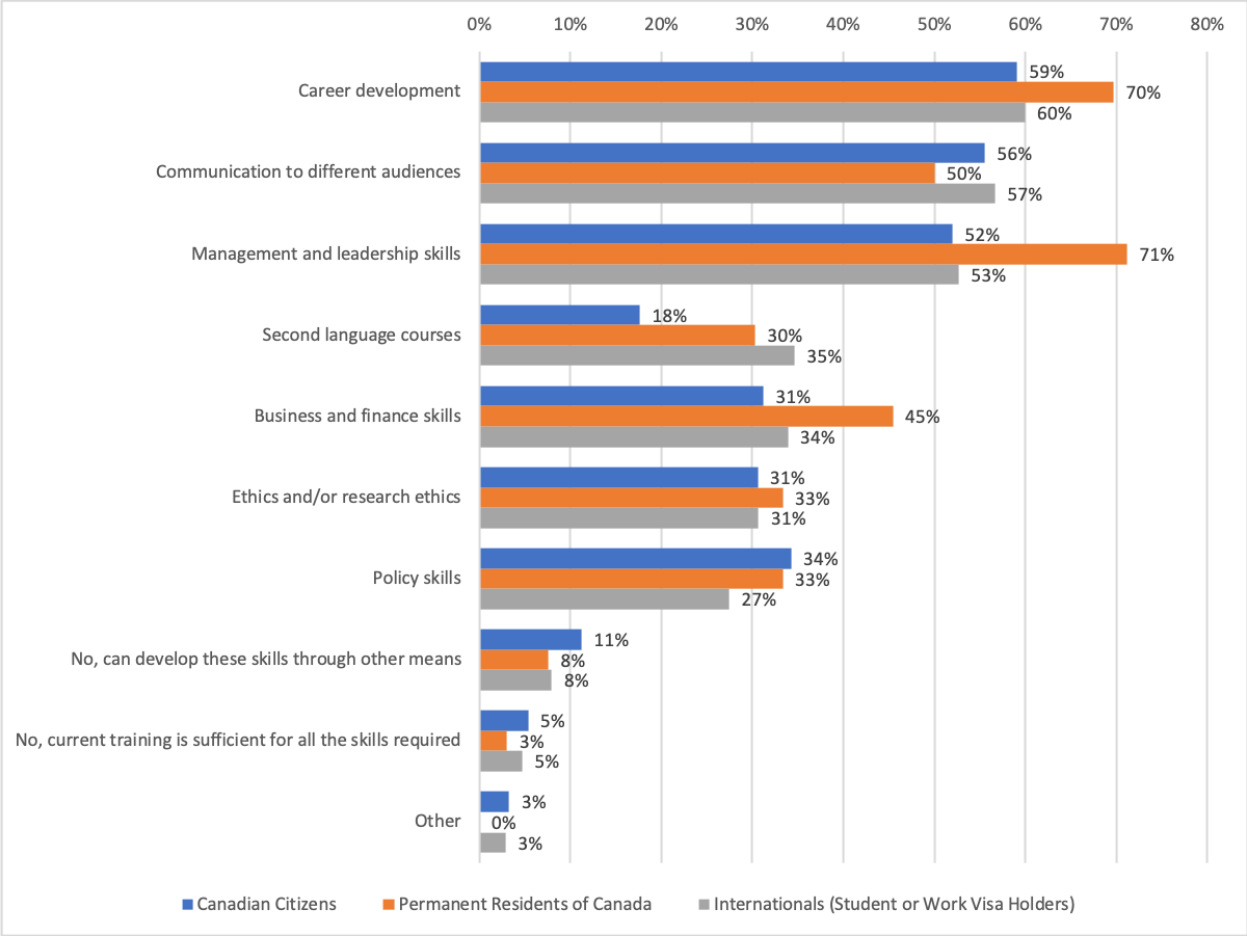


Figure 244: Skills desired to be incorporated into academic training, by percent. Multiple responses possible (n = 765, n = 66, n = 277). The grand majority of permanent residents indicated they would encourage management and career development skills to be integrated into academic training.

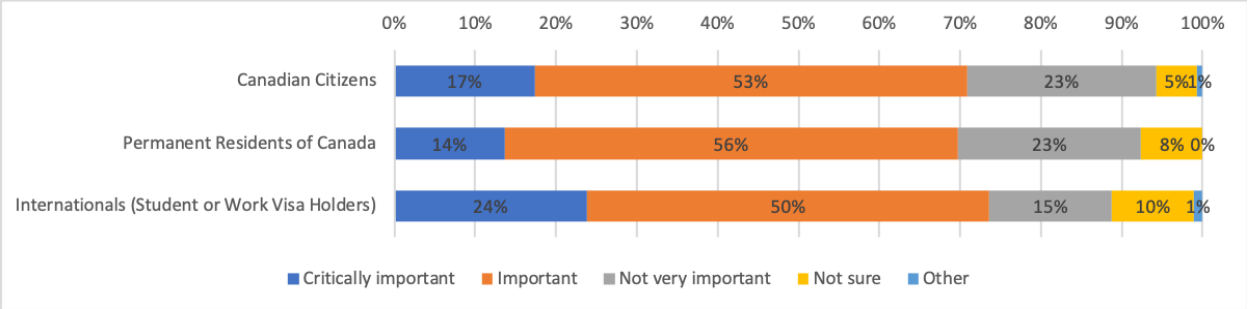


Figure 245: Importance of elite awards, by percent. Respondents were asked to evaluate the importance of the elite Vanier doctoral and Banting postdoctoral awards (n = 765, n = 66, n = 277).

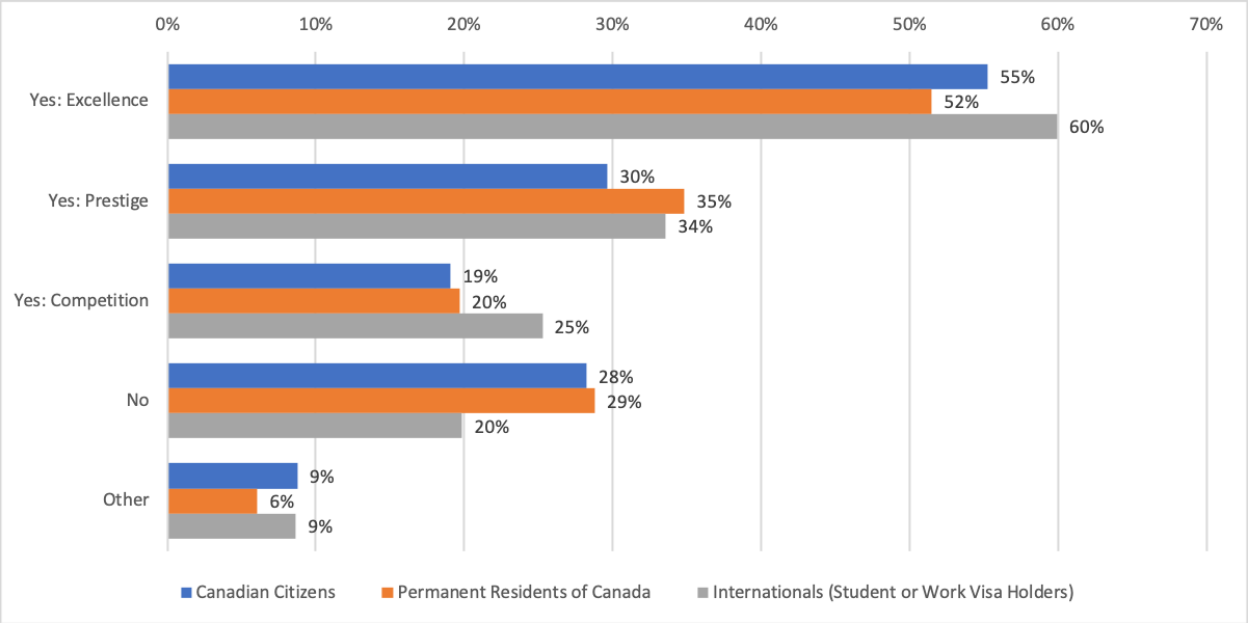


Figure 246: *Are elite awards a beneficial part of the current funding system?* Multiple selections possible (n = 765, n = 66, n = 277).

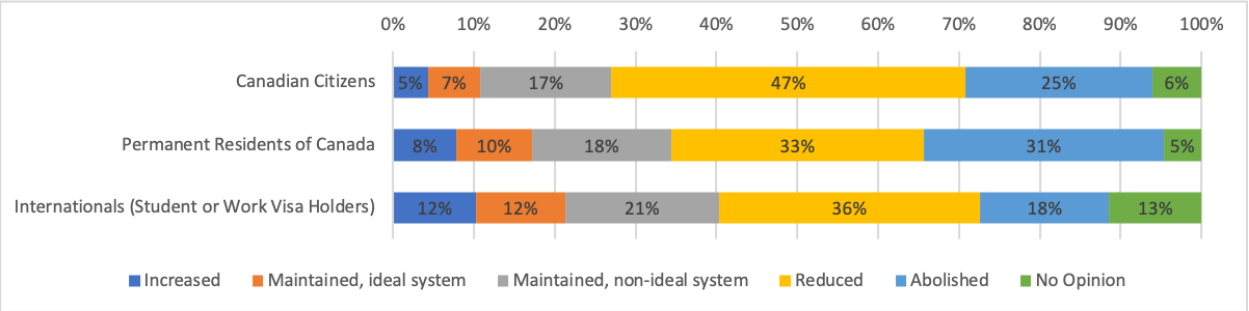


Figure 247: Recommendations for the elite awards system, by percent. Elite awards provide greater levels of support and prestige for select trainees, but the investment required reduces the total number of potential awards available. In considering this, applicants were asked to state their opinion of the current elite awards system (n = 765, n = 66, n = 277).

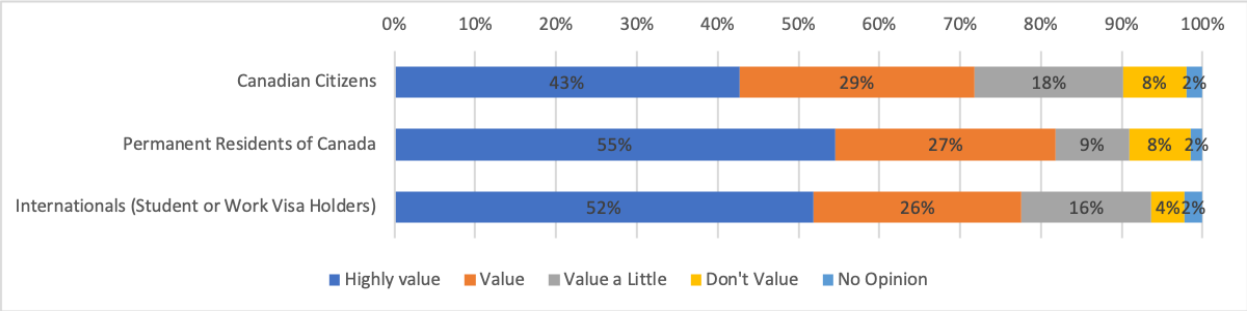


Figure 248: Valuation of the following factor given an increase in the federal budget: Increasing value of all scholarships and fellowships. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 752, n = 66, n = 268).

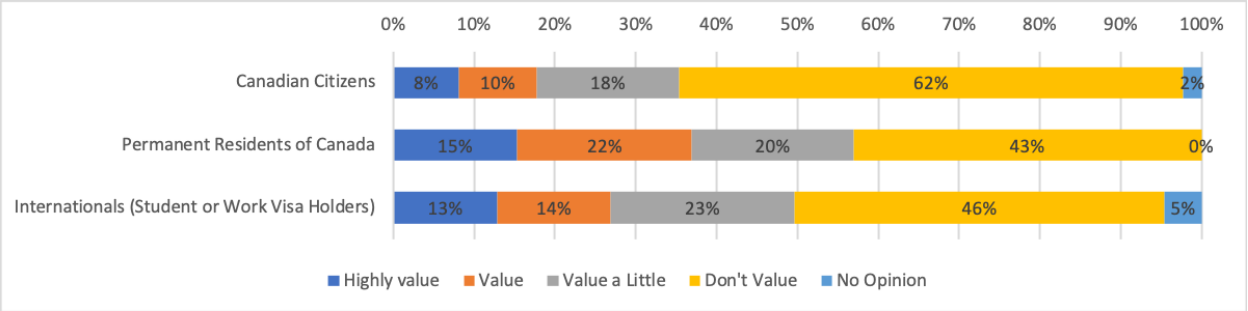


Figure 249: Valuation of the following factor given an increase in the federal budget: Increasing value of elite awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 741, n = 65, n = 264).

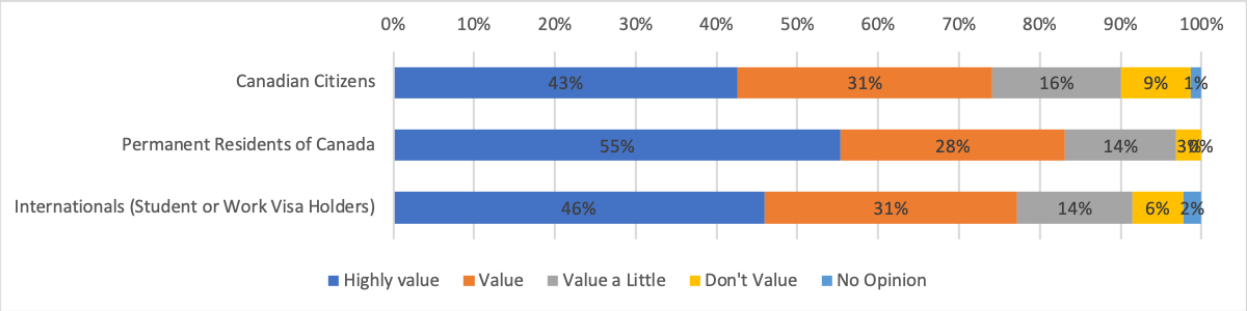


Figure 250: Valuation of the following factor given an increase in the federal budget: Increasing value of standard awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 748, n = 65, n = 268).

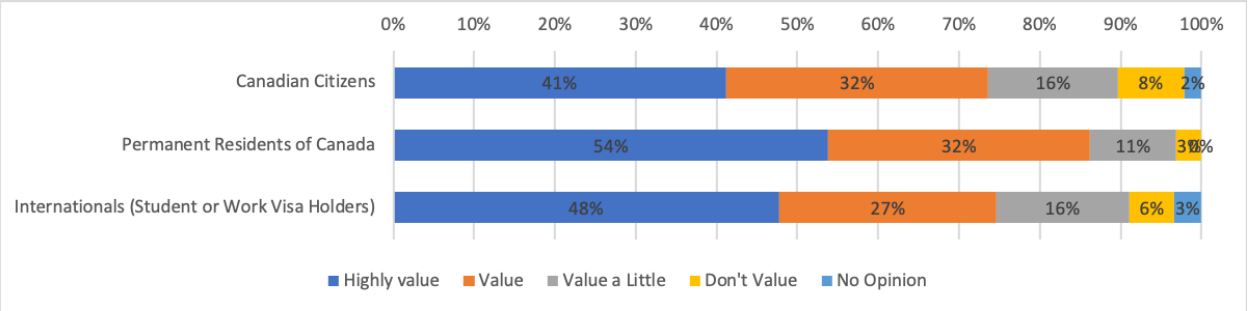


Figure 251: Valuation of the following factor given an increase in the federal budget: Increasing value of all graduate student awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 743, n = 65, n = 268). (figure on previous page)

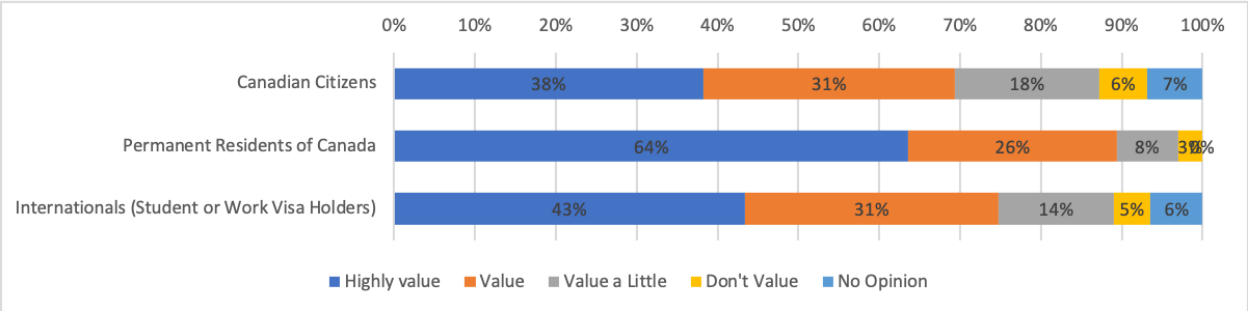


Figure 252: Valuation of the following factor given an increase in the federal budget: Increasing value of postdoctoral awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 751, n = 66, n = 268).

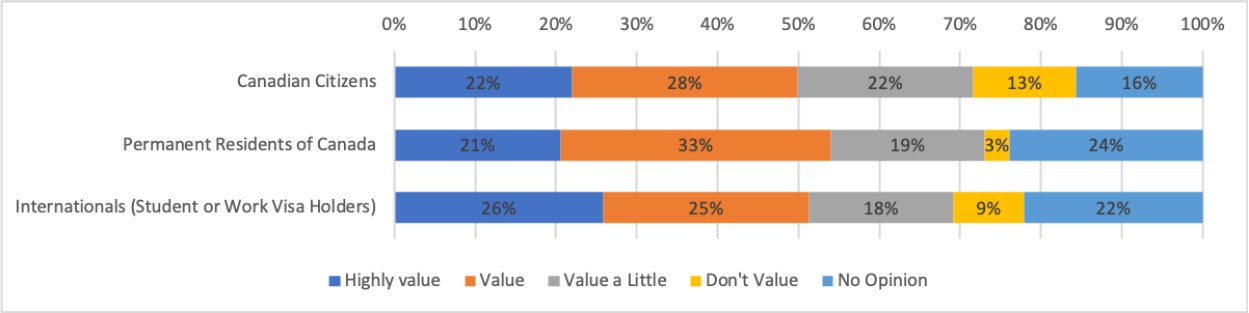


Figure 253: Valuation of the following factor given an increase in the federal budget: Increasing the value of specifically PGS-D Awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 737, n = 63, n = 263).

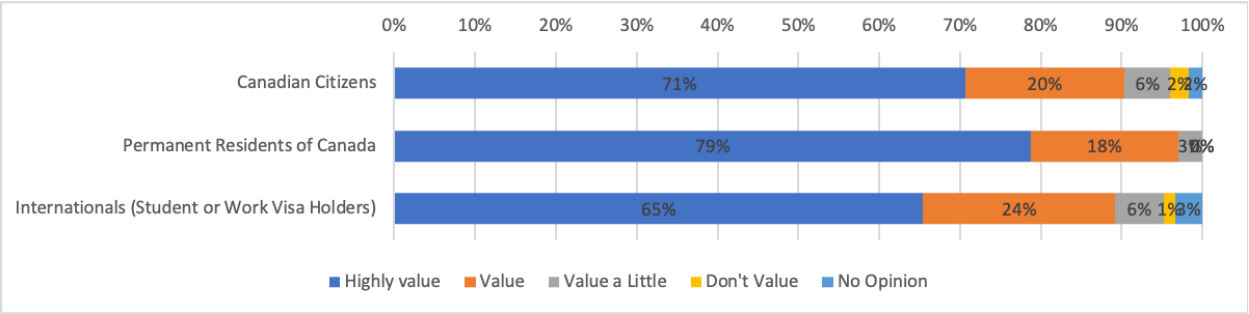


Figure 254: Valuation of the following factor given an increase in the federal budget: Increasing the total number of fellowships given. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 749, n = 66, n = 269).

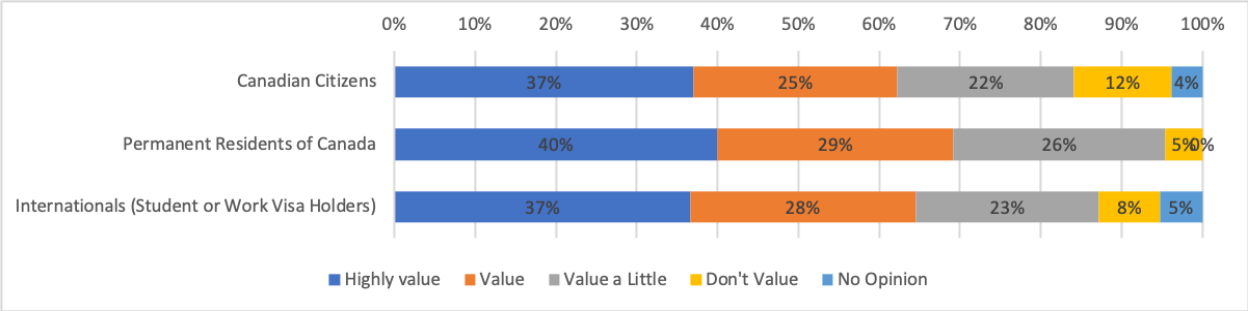


Figure 255: Valuation of the following factor given an increase in the federal budget: Increasing length of awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 750, n = 65, n = 265).

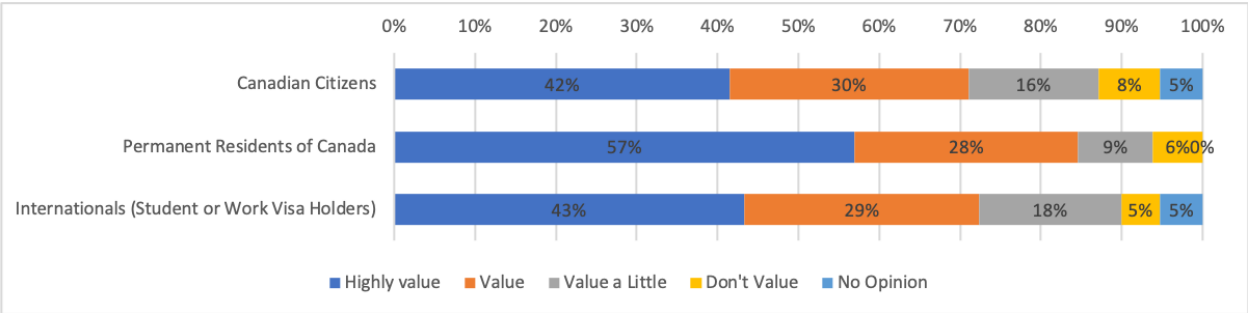


Figure 256: Valuation of the following factor given an increase in the federal budget: Increasing eligibility time of awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 749, n = 65, n = 268).

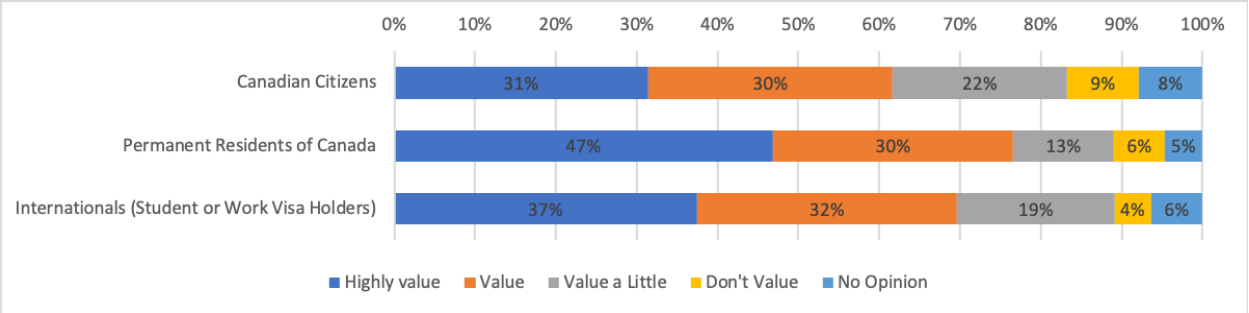


Figure 257: Valuation of the following factor given an increase in the federal budget: Increasing the number of interdisciplinary awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 751, n = 64, n = 267).

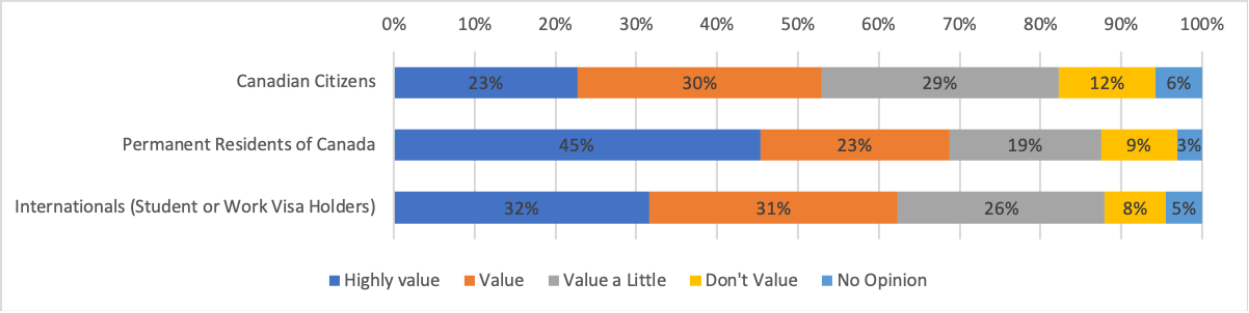


Figure 258: Valuation of the following factor given an increase in the federal budget: Increasing the number of travel awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 748, n = 64, n = 266). (figure on previous page)

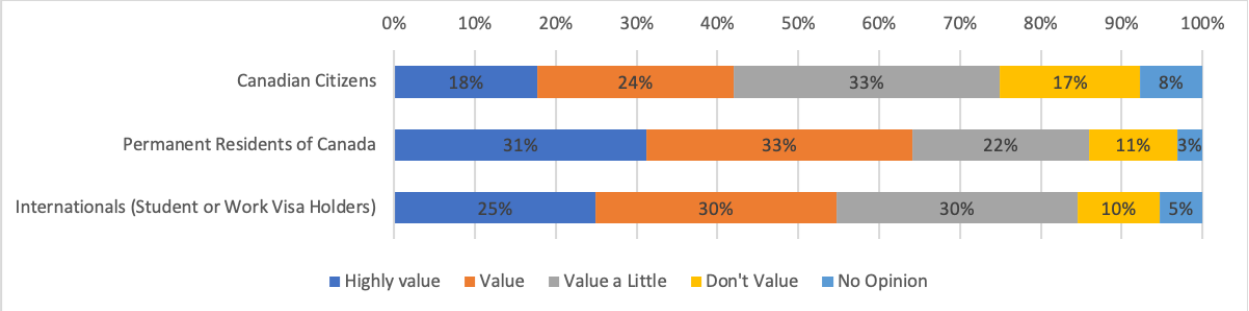


Figure 259: Valuation of the following factor given an increase in the federal budget: Increasing value of travel awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 739, n = 64, n = 265).

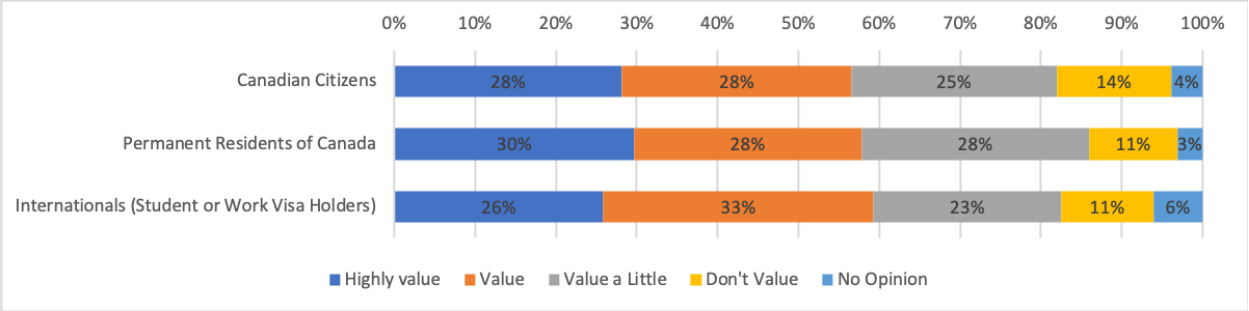


Figure 260: Valuation of the following factor given an increase in the federal budget: Increasing awards for outreach/engagement activities. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 748, n = 64, n = 263).

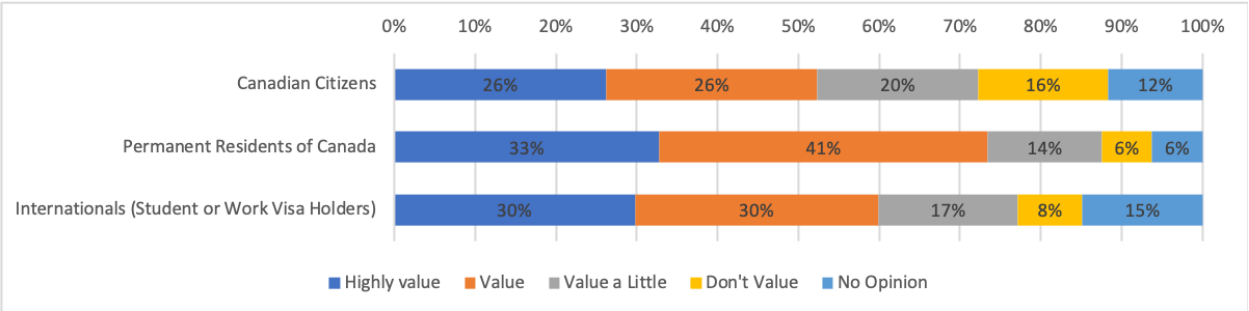


Figure 261: Valuation of the following factor given an increase in the federal budget: Harmonizing value amount of awards across CIHR, NSERC, SSHRC. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 747, n = 64, n = 262).

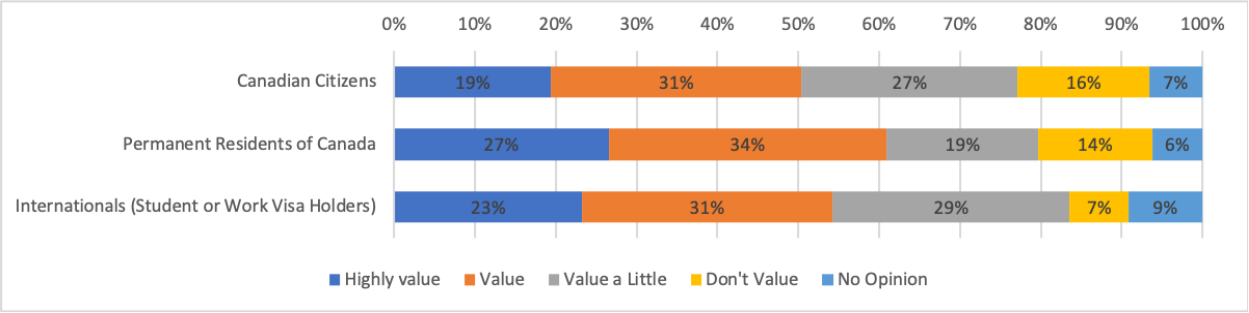


Figure 262: Valuation of the following factor given an increase in the federal budget: Including skills or impact-oriented activities as criteria for evaluation for all awards. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 748, n = 64, n = 262). (figure on previous page)

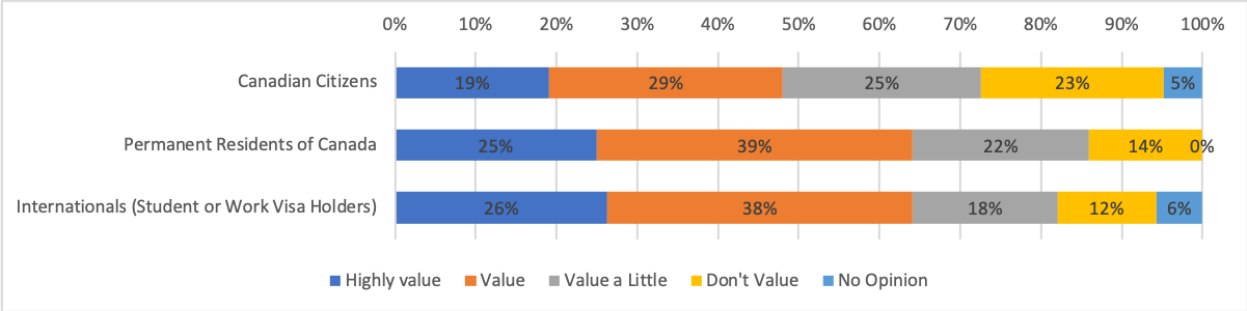


Figure 263: Valuation of the following factor given an increase in the federal budget: Including reports to be filled out by awardees at the end of the award to track outcomes. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 748, n = 64, n = 262).

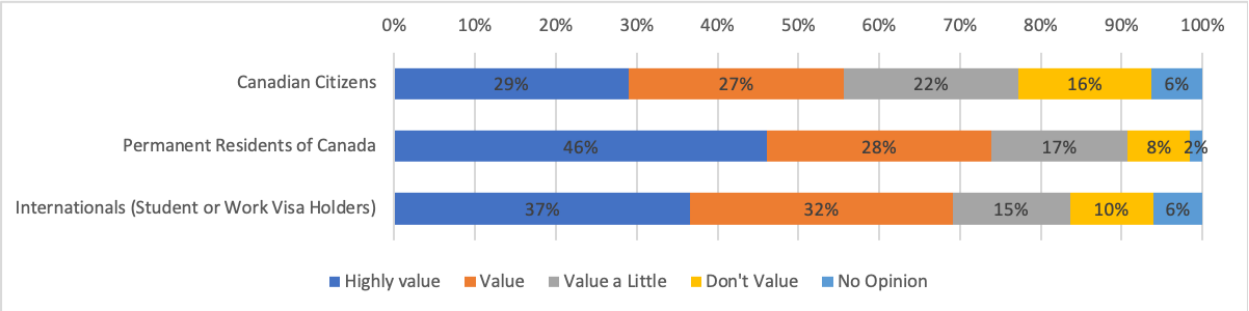


Figure 264: Valuation of the following factor given an increase in the federal budget: Include funding for peripheral support. Respondents were asked to indicate how much they value the above factor if there were an increase in the total federal budget for graduate and postdoctoral awards (n = 746, n = 65, n = 262). Peripheral support may include health/dental benefits, EI/CPP, etc.

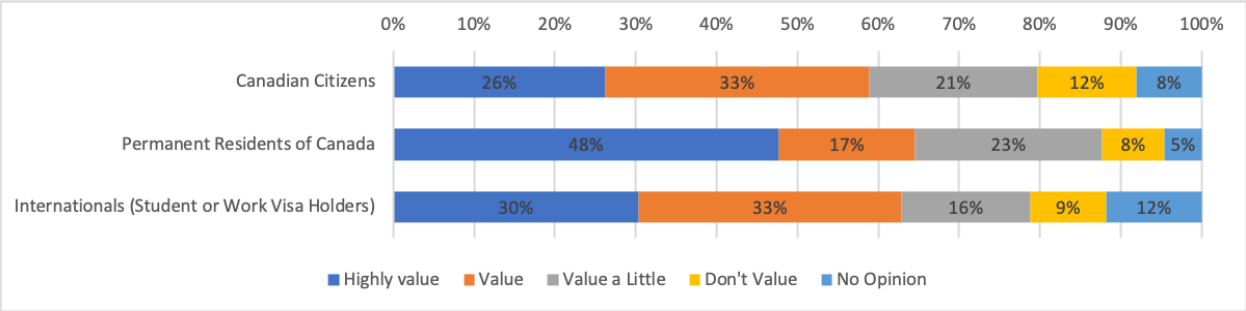


Figure 265: Valuation of the following factor given an increase in the federal budget: More support for awardees with dependents. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 748, n = 65, n = 264).

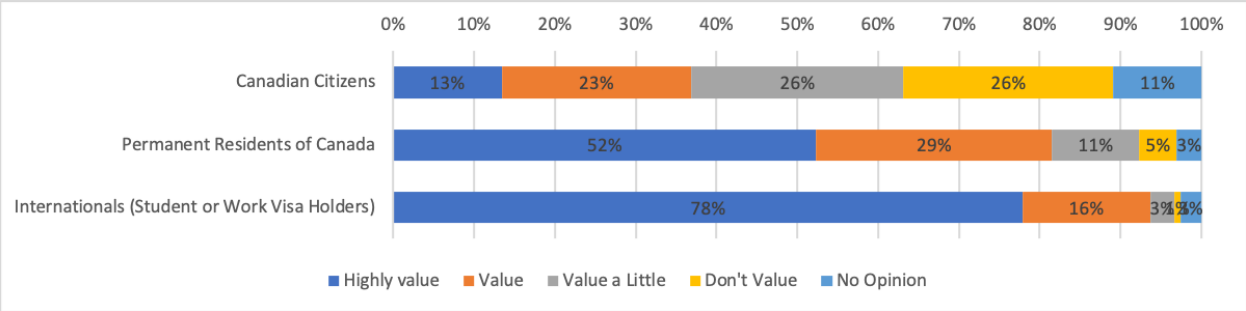


Figure 266: Valuation of the following factor given an increase in the federal budget: Increasing the number of awards open to international applicants. Respondents were asked to indicate how much they value the above factor If there were an increase in the total federal budget for graduate and postdoctoral awards (n = 745, n = 65, n = 267).

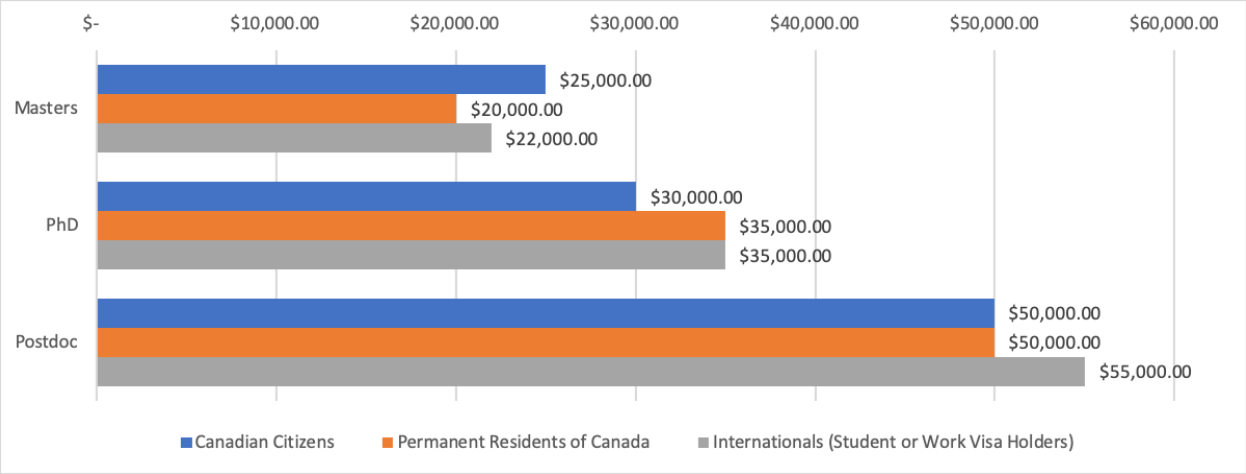


Figure 267: Recommended value of federal awards by level of study. Respondents were asked to generate ideal award values given inflation and the present costs of living in university towns, given there was an increase in the federal budget (n = 765, n = 66, n = 277). Median values are reported.

Conclusions

International students bring essential diversity and a profusion of new and challenging ideas to our academic climate. The main barrier cited by international students and postdoctoral fellows is that awards are not accessible to them. Indeed, 7 in 10 international students surveyed found it difficult or very difficult to secure funding in Canada. Even while residing in the country, many awards are not available to international trainees; over half of them apply to only one fellowship during their training due to the lack of award eligibility. Even when international students are eligible to apply for external funding, they are less likely to be successful in their application. Our survey found that little over a quarter of international students secure tri-council funds compared to 60% among Canadian residents. This further reinforces the perceived belief that international students or postdoctoral fellows have lower chances of application success compared to Canadian trainees. It is therefore not surprising that international ECRs are more likely to value elite awards, for which they are actually eligible, and that they further believe that these awards should be maintained or increased

International trainees recognize the importance of career development skills in their training. Indeed, many students and postdoctoral fellows do not aim to pursue a career in academia[11]. In preparation for diverse careers, international ECRs encourage the following skills training to be supported by fellowships: business, finance, leadership, management and second language skills. Not only is it more difficult for internationals to distinguish themselves in Canadian academia without receiving awards, but it is increasingly challenging to transition to other sectors post-graduation as this is also influenced by the perceived excellence of being an award recipient.

Heightened financial challenges due to residency status also create barriers for the recruitment and retention of international trainees. International trainees have a higher cost of living simply due to increased tuition costs at host universities. Oftentimes these higher fares are not reflected in award value or the institution-stipulated minimum stipends. Thus, 7 in 10 international trainees and three quarters of permanent residents greatly value including peripheral support in their fellowships; these supports would help cover the additional financial burden of inherently reduced access to healthcare and other social services. Many international trainees are eligible for fewer awards from their originating country since they are undertaking training in Canada. Finally, many international students and fellows have a first language that is neither official language of English nor French, creating an added challenge to conducting research and navigating services in Canada. As such, over a third of international respondents recommend the inclusion of language skills training in their funding package.

By funding international trainees, Canada can help promote the diversity brought by these ECRs into the country. Likewise, supporting young international researchers will encourage the growth of fruitful research networks and collaborations both domestically and abroad. These are critical components of our transition to a knowledge-based economy.

[11] Walters, D., Zarifa, D. & Etmanski, B. "Employment in Academia: To What Extent Are Recent Doctoral Graduates of Various Fields of Study Obtaining Permanent Versus Temporary Academic Jobs in Canada?" *High Educ Policy* (2020). https://doi-org.proxy3.library.mcgill.ca/10.1057/s41307-020-00179-w

Subsection A: Cross Analysis by Field of Study

The responses of international students and postdocs were cross analyzed by field of study to uncover the unique perspectives of trainees in varying fields. Specifically, we were interested in their experiences with immigration to Canada, described in **Figures 268-280**, as well as which awards are available to these respondents in their respective fields, in **Figures 281-288**.

Responses from over 300 international and permanent resident respondents in health (63 researchers), humanities (7), life sciences (143), social sciences (108), and physical sciences, math and engineering (28) were analyzed. For continuity we also present the data of international students and postdoctoral researchers in interdisciplinary fields (2 independent respondents). If no respondents from a given field answered a given question, this field is still shown on the graph, with no data visualized.

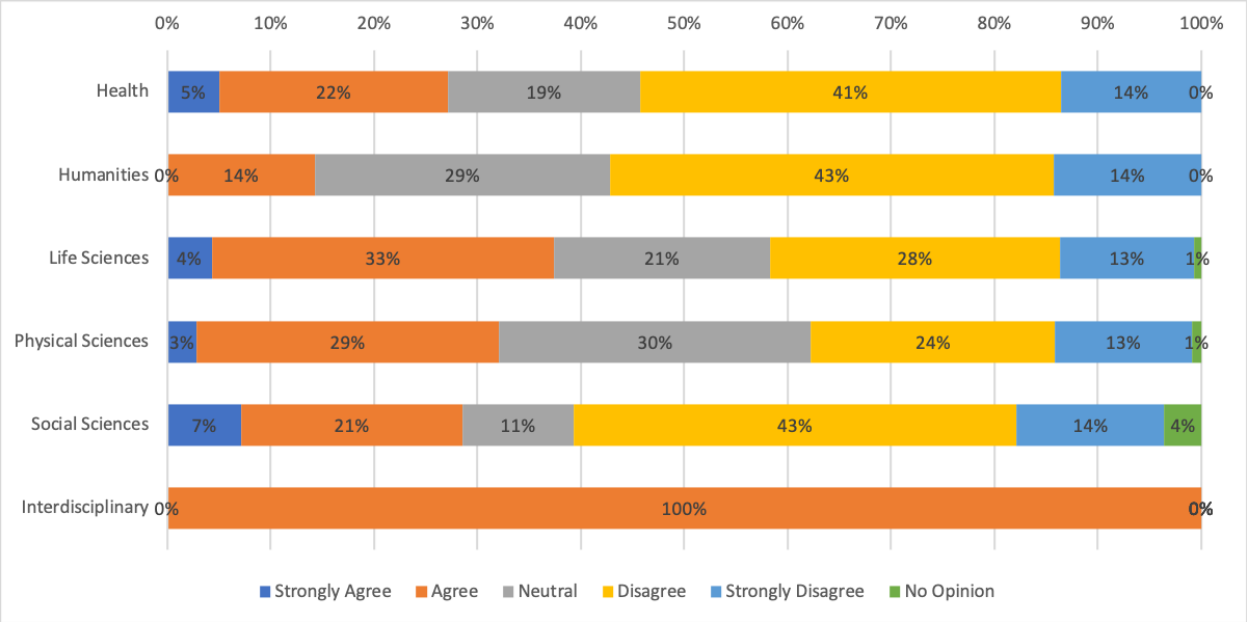


Figure 268: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Information on awards for international students/postdocs is easily accessible*. Reported by percent (n = 59, n = 7, n = 139, n = 106, n = 28, n = 2).

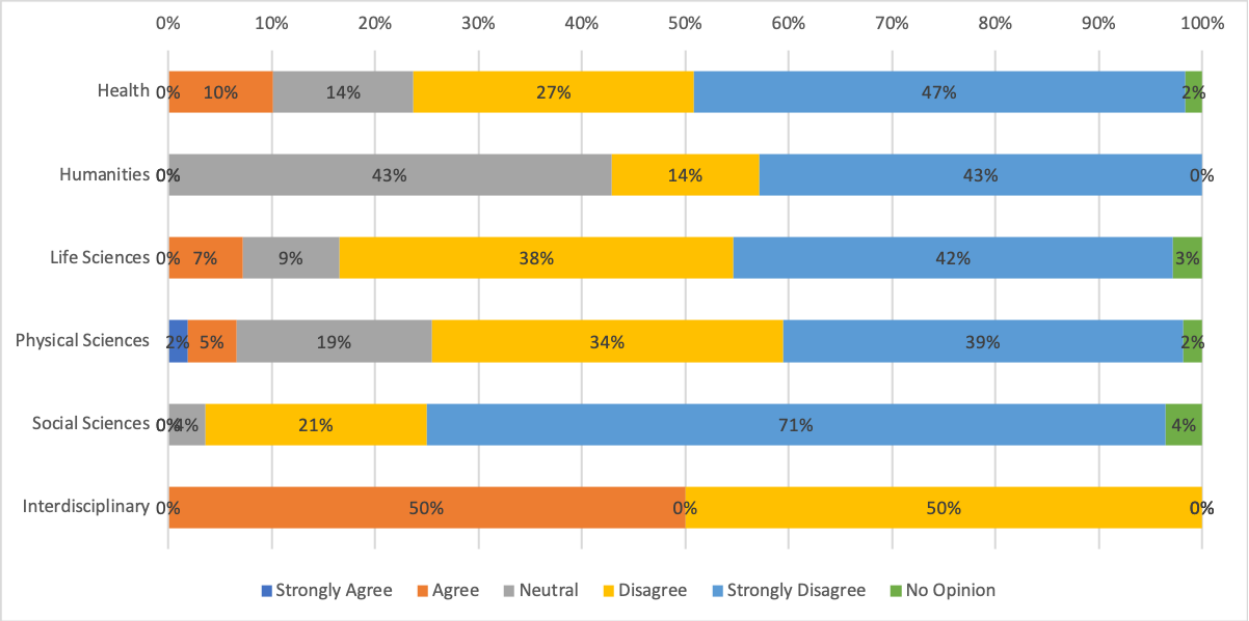


Figure 269: Agreement of international respondents with the following statement regarding their funding experience or immigration: *There are an adequate number of awards for international students/postdocs*. Reported by percent (n = 59, n = 7, n = 139, n = 106, n = 28, n = 2).

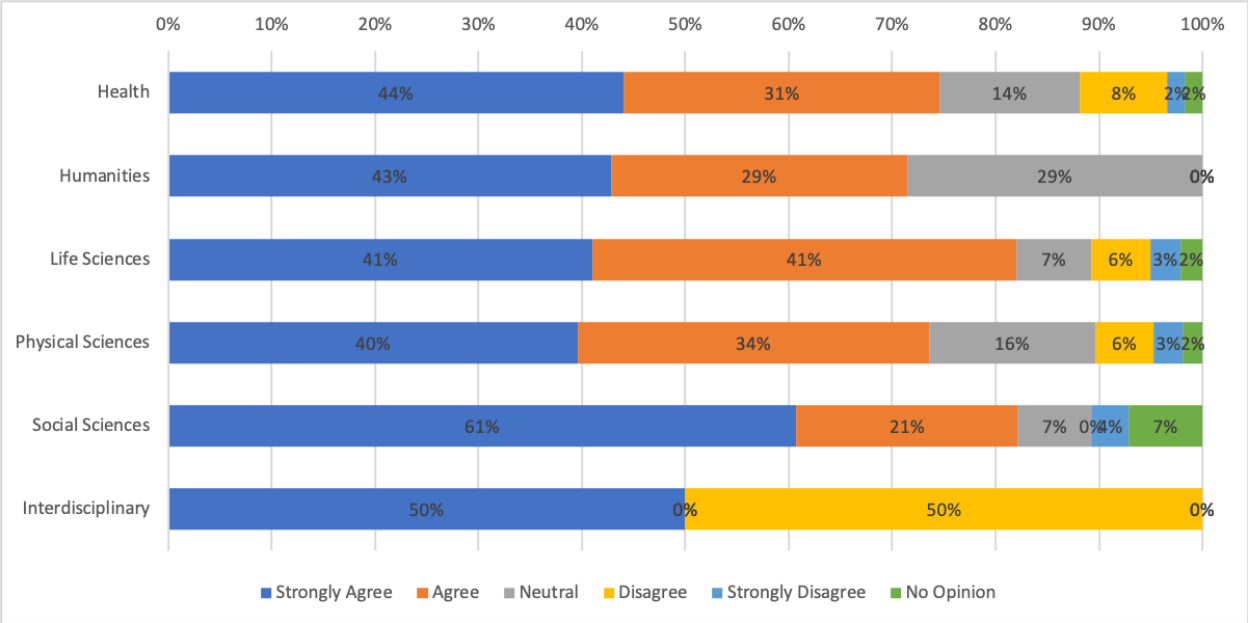


Figure 270: Agreement of international respondents with the following statement regarding their funding experience or immigration: *There are not enough awards for international students/postdocs*. Reported by percent (n = 59, n = 7, n = 139, n = 106, n = 28, n = 2).

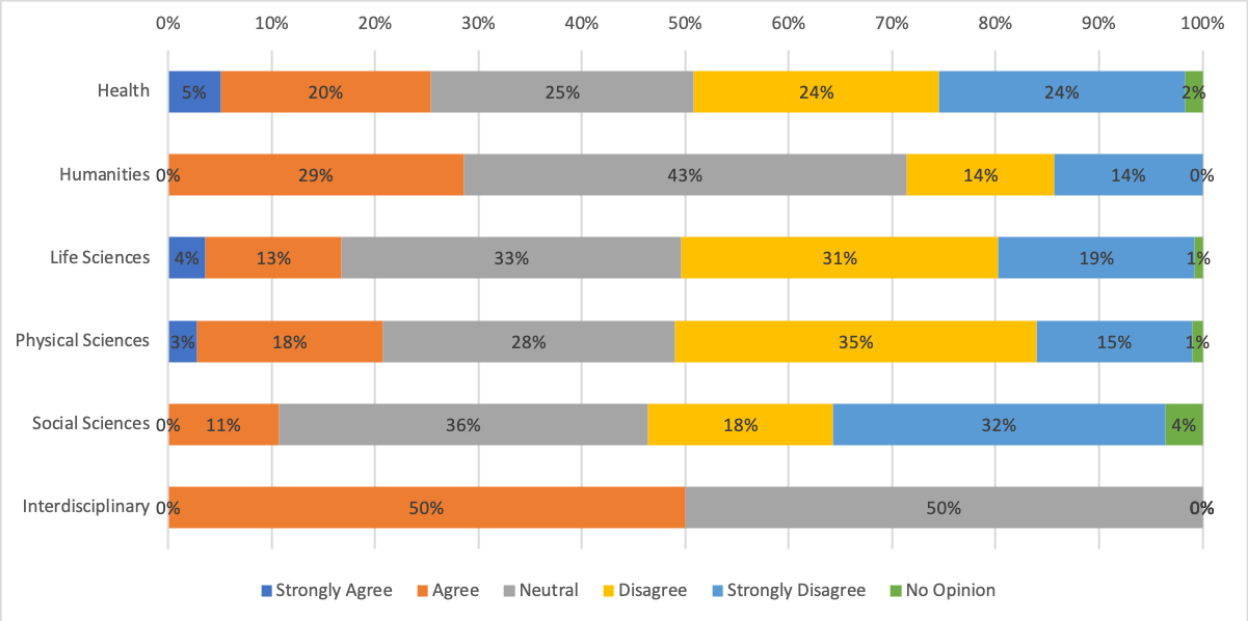


Figure 271: Agreement of international respondents with the following statement regarding their funding experience or immigration: *There are adequate resources to help access and apply for awards for international students/postdocs*. Reported by percent (n = 59, n = 7, n = 139, n = 106, n = 28, n = 2).

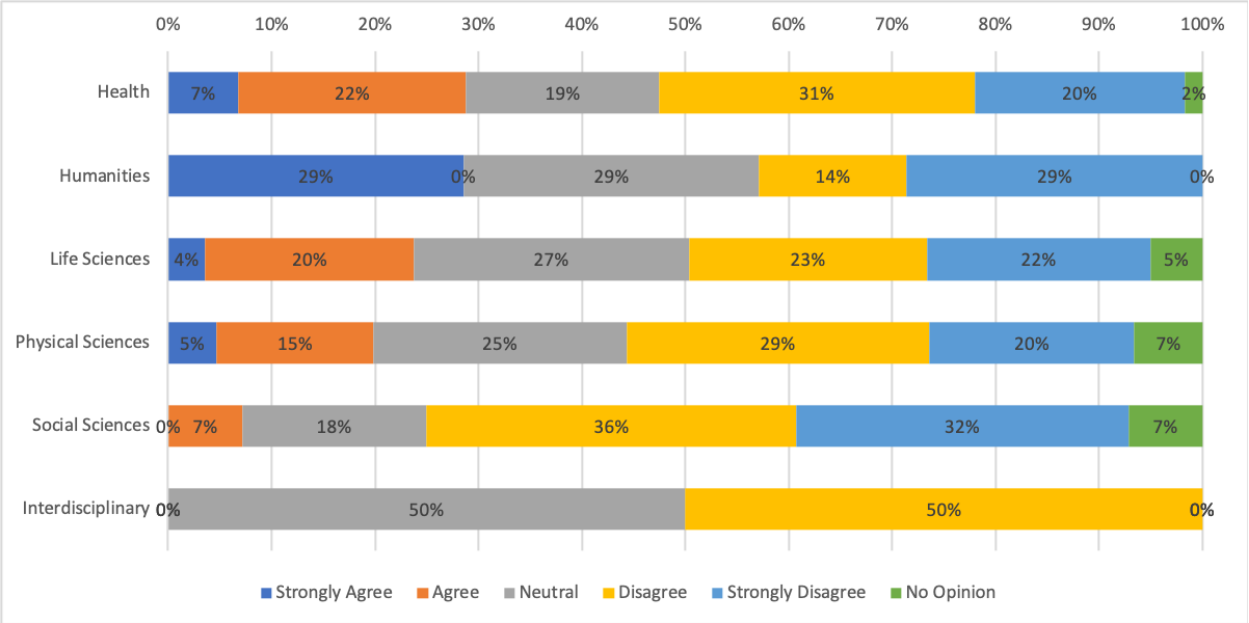


Figure 272: Agreement of international respondents with the following statement regarding their funding experience or immigration: *The value of awards is adequate.* Reported by percent (n = 59, n = 7, n = 137, n = 106, n = 28, n = 2).

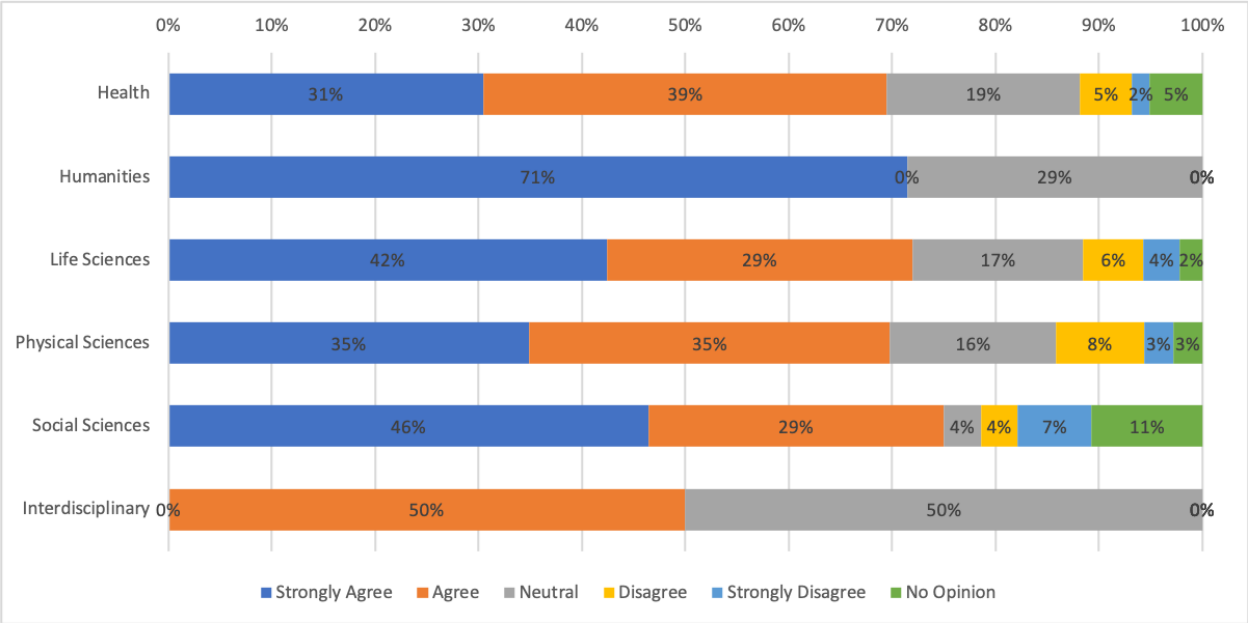


Figure 273: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Specific incentives for international students are lacking*. Incentives include specific awards, specific reduction of certain taxes, etc. Reported by percent (n = 59, n = 7, n = 139, n = 106, n = 28, n = 2)

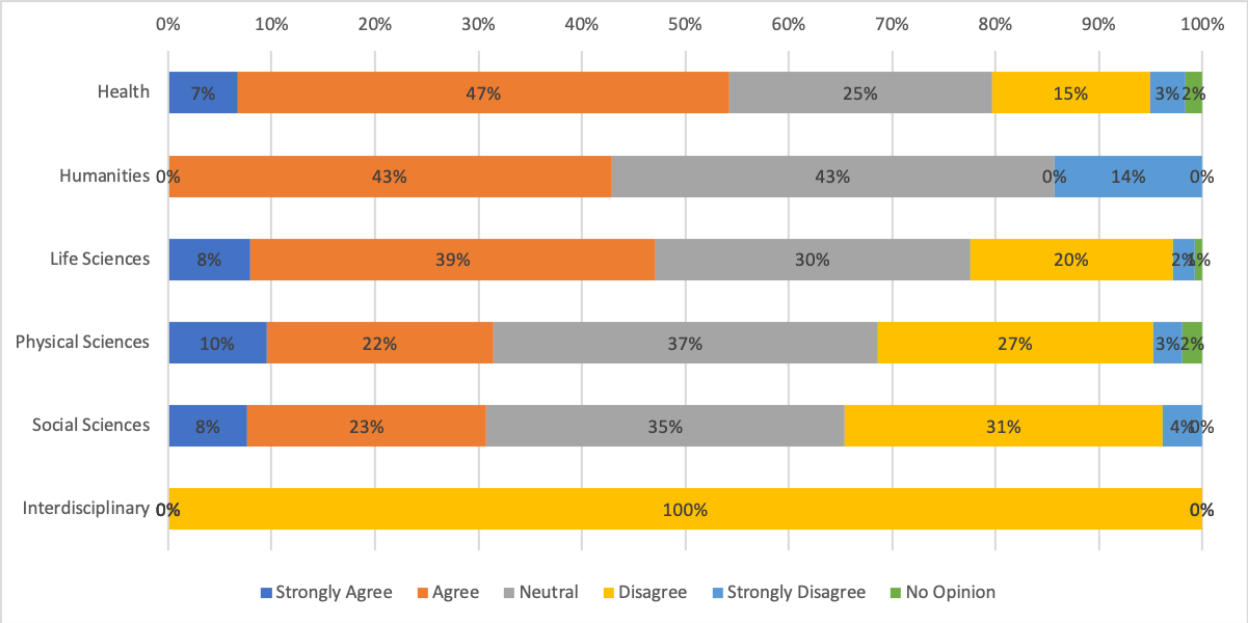


Figure 274: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Finding reliable information specific for international students/postdocs.* Reported by percent (n = 59, n = 7, n = 139, n = 105, n = 28, n = 2).

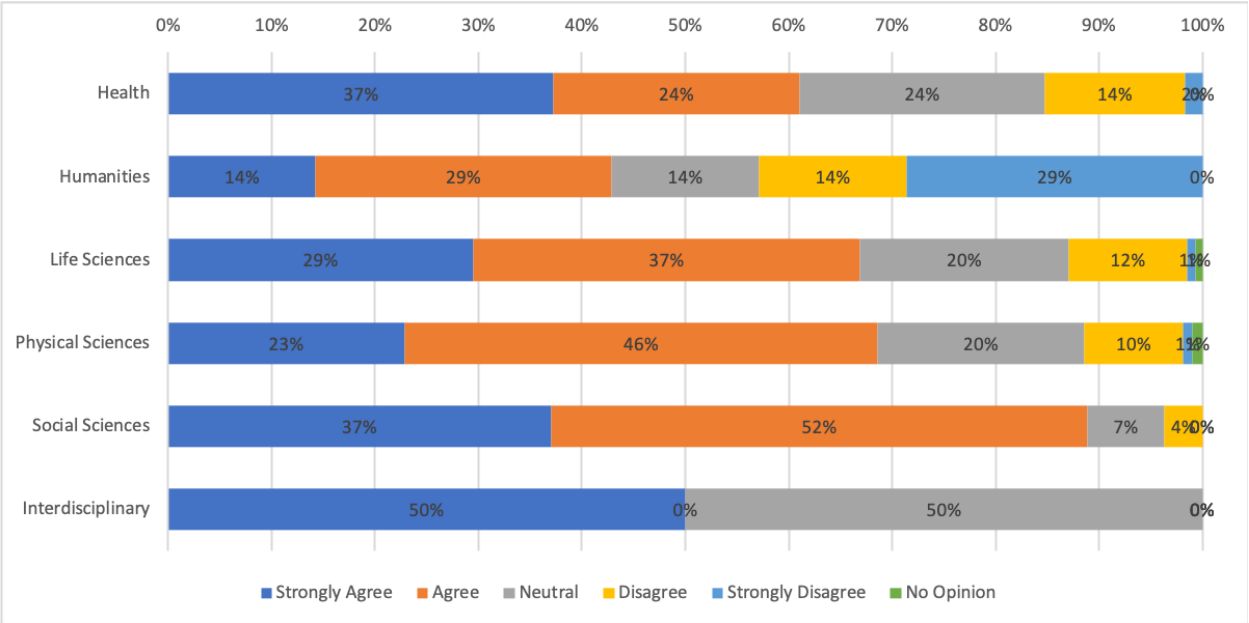


Figure 275: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Finding funding.* Reported by percent (n = 59, n = 7, n = 138, n = 105, n = 28, n = 2).

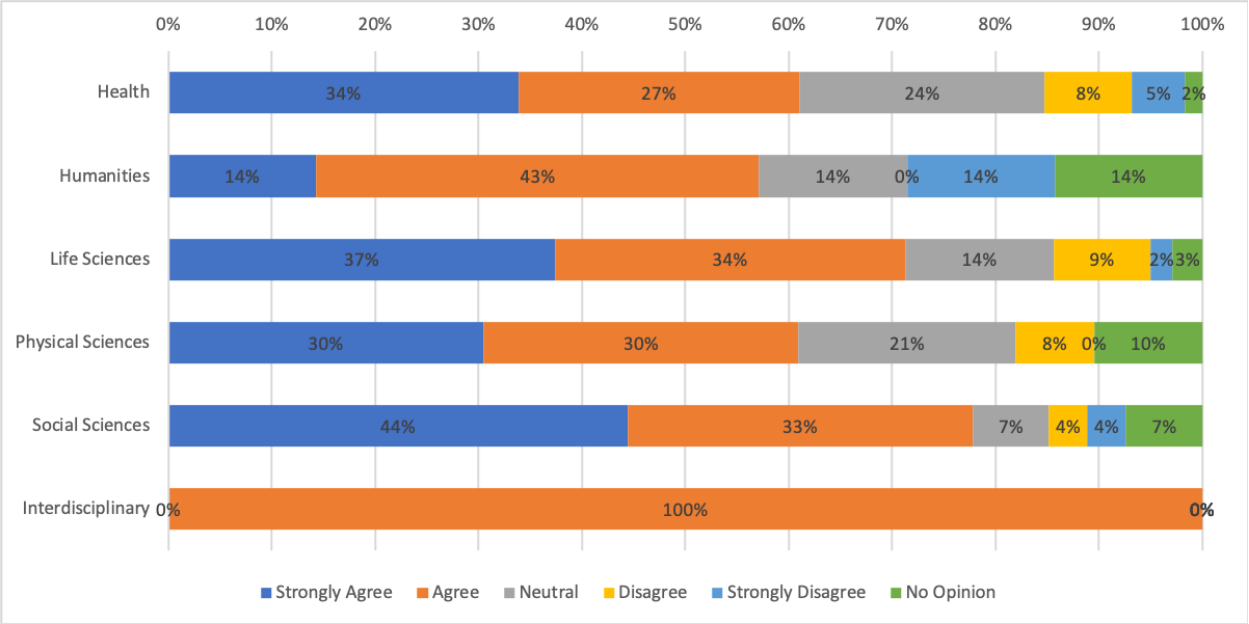


Figure 276: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Applying for federal awards.* Reported by percent (n = 59, n = 7, n = 139, n = 105, n = 27, n = 2).

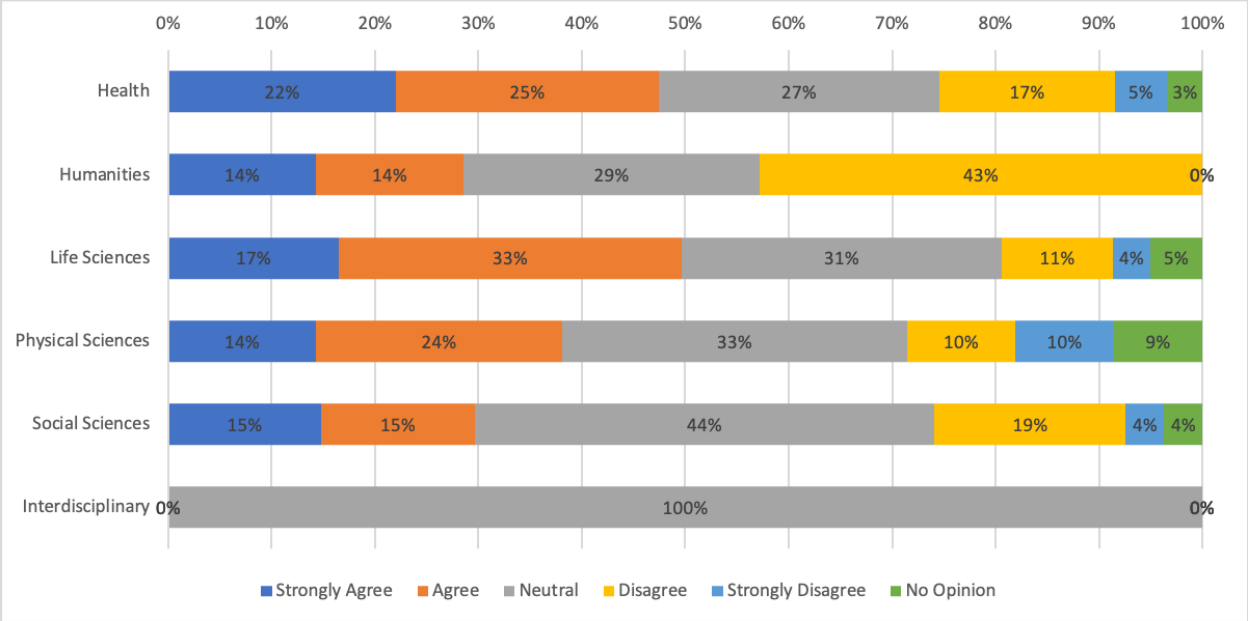


Figure 277: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Being competitive (criteria of research excellence in Canadian awards is different from country(ies) where previously studied).* Reported by percent (n = 59, n = 7, n = 139, n = 105, n = 27, n = 2).

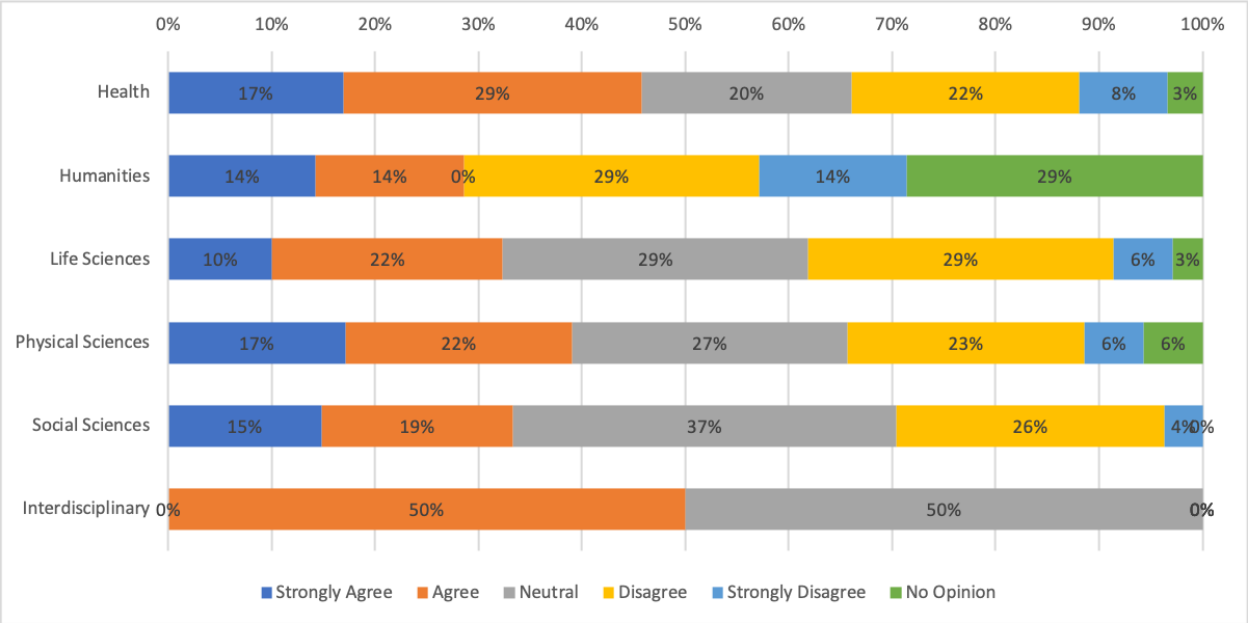


Figure 278: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Immigration procedures.* Reported by percent (n = 59, n = 7, n = 139, n = 105, n = 27, n = 2).

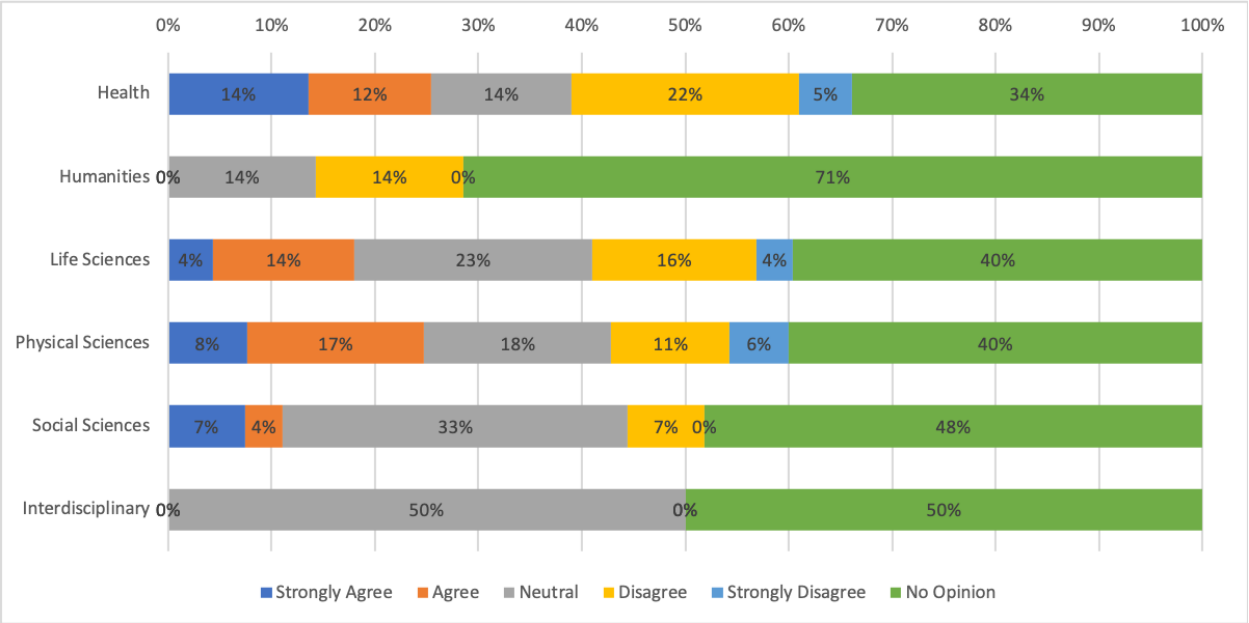


Figure 279: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Bringing spouse/partner/dependents (immigration issues).* Reported by percent (n = 59, n = 7, n = 139, n = 105, n = 27, n = 2).

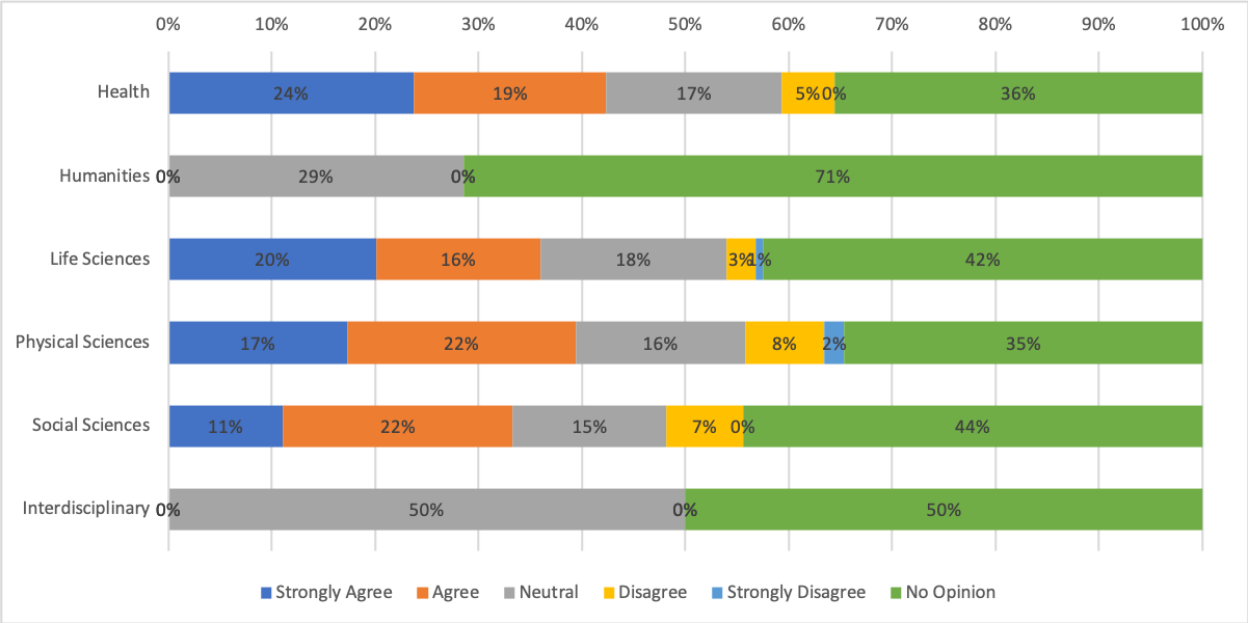


Figure 280: Agreement of international respondents with the following statement regarding their funding experience or immigration: *Ability to support dependents once arrived.* Reported by percent (n = 59, n = 7, n = 139, n = 104, n = 27, n = 2).

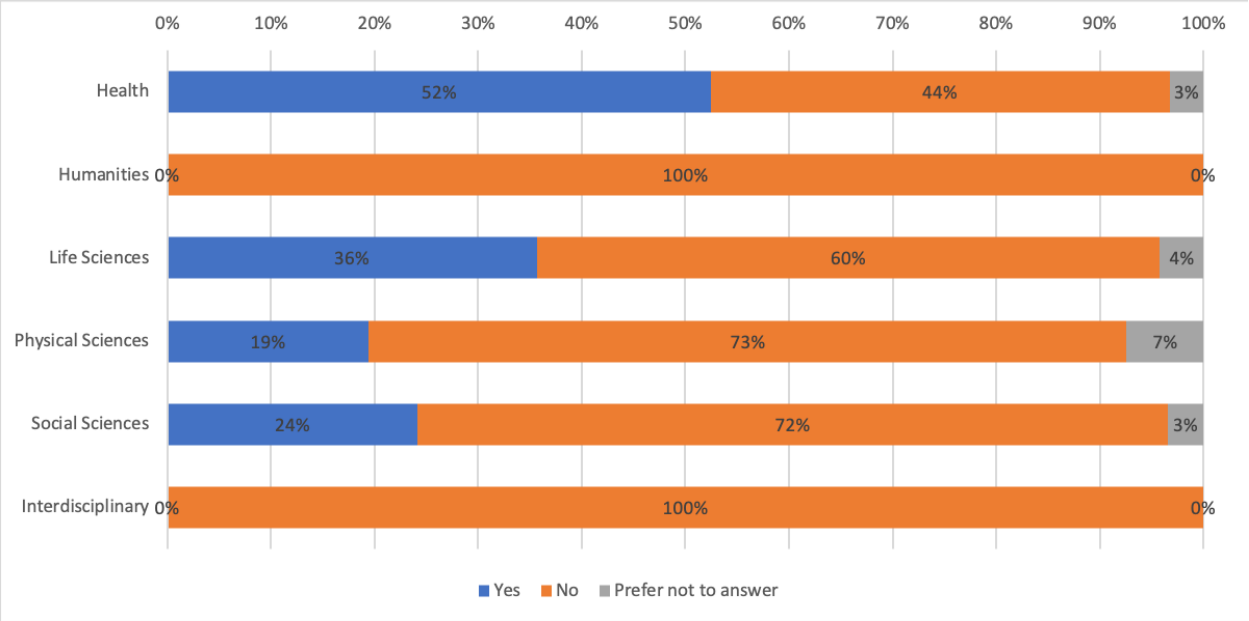


Figure 281: *Have you ever applied for a graduate or postdoctoral fellowship through CIHR, NSERC, or SSHRC?* (n = 61, n = 7, n = 143, n = 108, n = 29, n = 2).

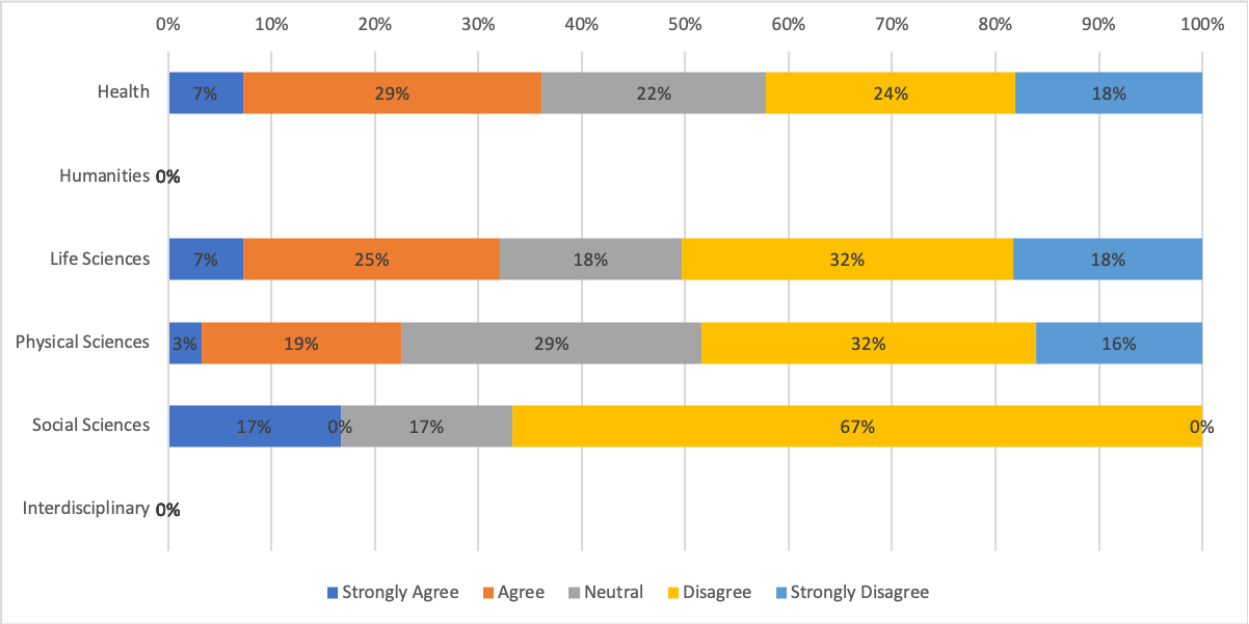


Figure 282: *Please state to what degree you agree with the following statement: I received adequate resources to help me complete my application.* Respondents who applied for a federal grant were asked to state their agreeance with the above statement (n = 83, n = 0, n = 137, n = 62, n = 18, n = 0).

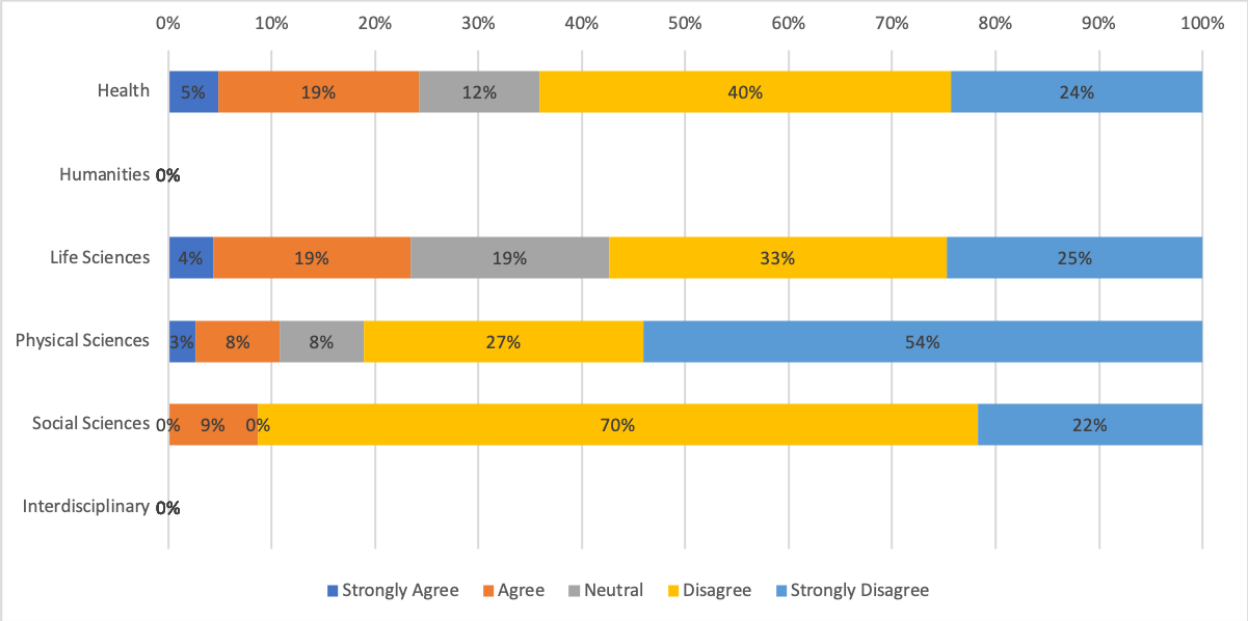


Figure 283: *Please state to what degree you agree with the following statement: I received useful feedback from my application, whether or not it was successful?* Respondents who applied for a federal grant were asked to state their agreeance with the above statement (n = 103, n = 0, n = 162, n = 74, n = 23, n = 0).

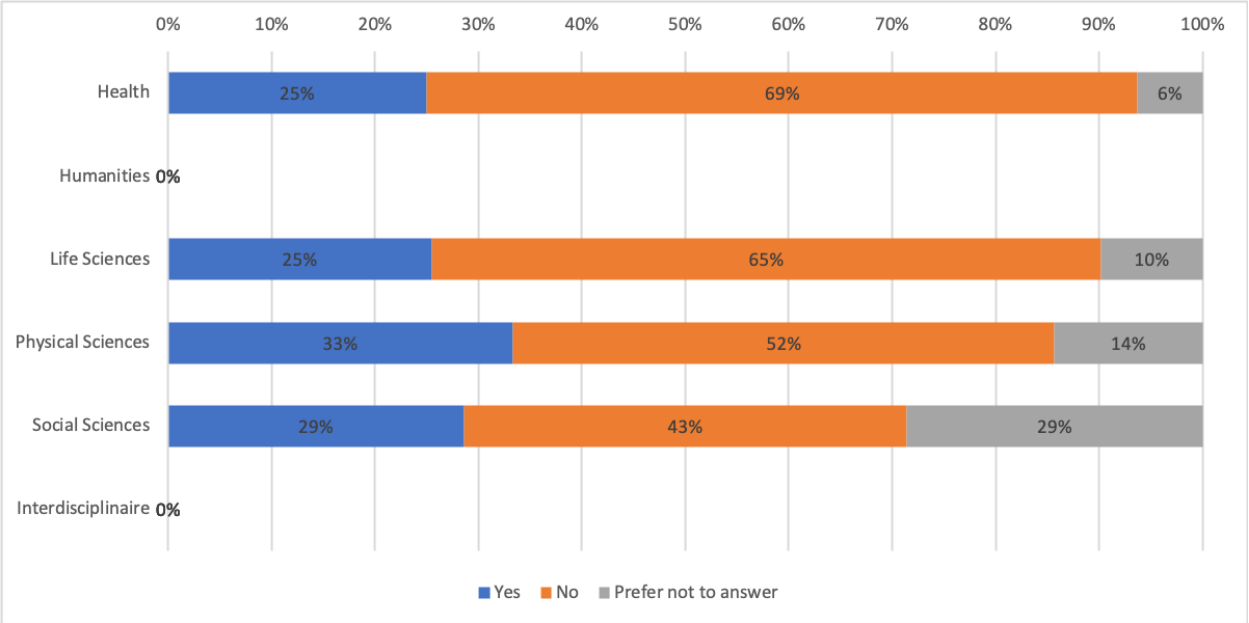


Figure 284: *Were any of your application(s) successful?* Respondents who applied for a federal grant were asked to state if their application was successful (n = 31, n = 0, n = 51, n = 21, n = 7, n = 0).

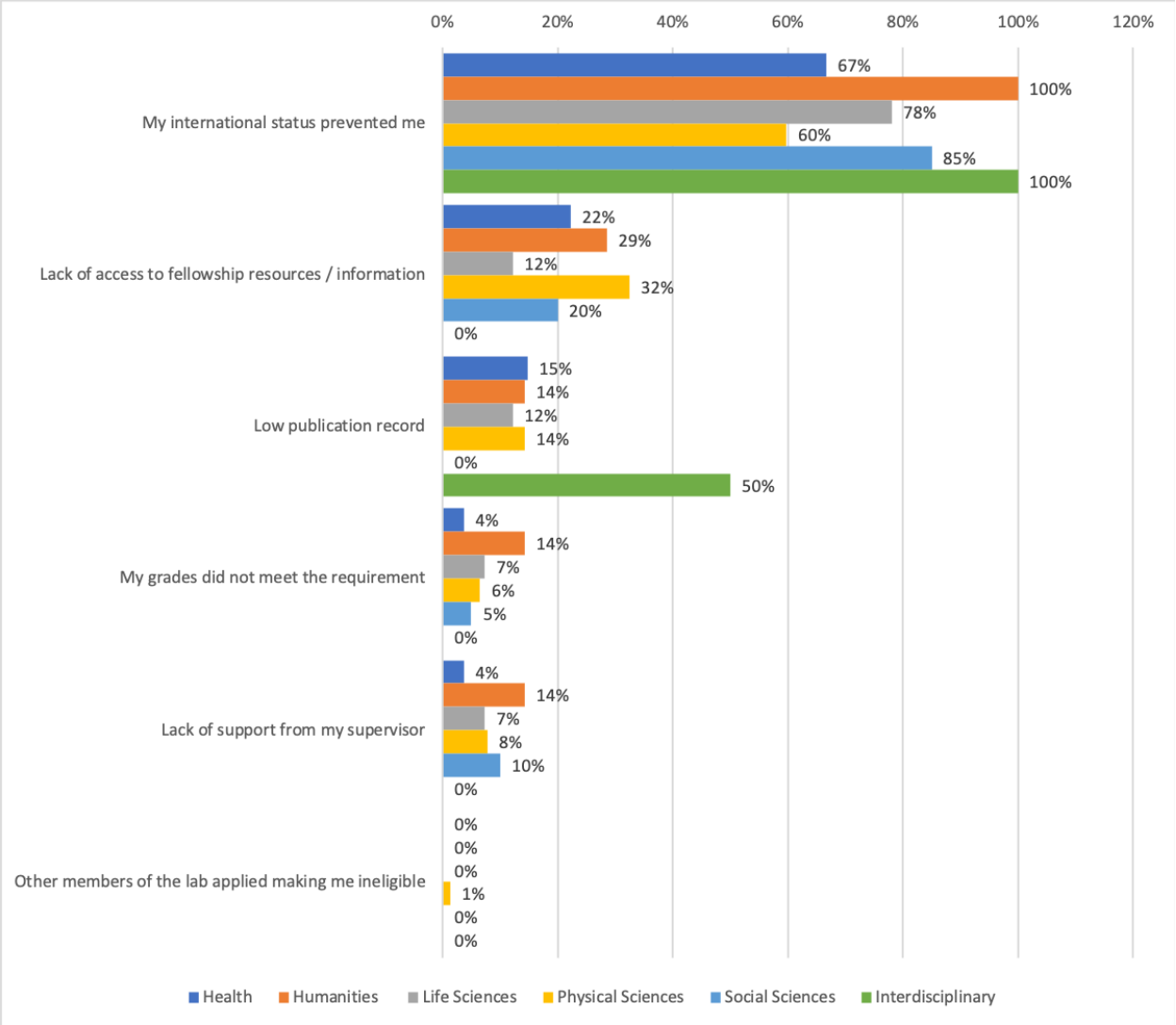


Figure 285: *What prevented you from applying?* Respondents were asked to indicate the reason that prevented them from applying for fellowships/scholarships. (n = 27, n = 7, n = 82, n = 77, n = 20, n = 2).

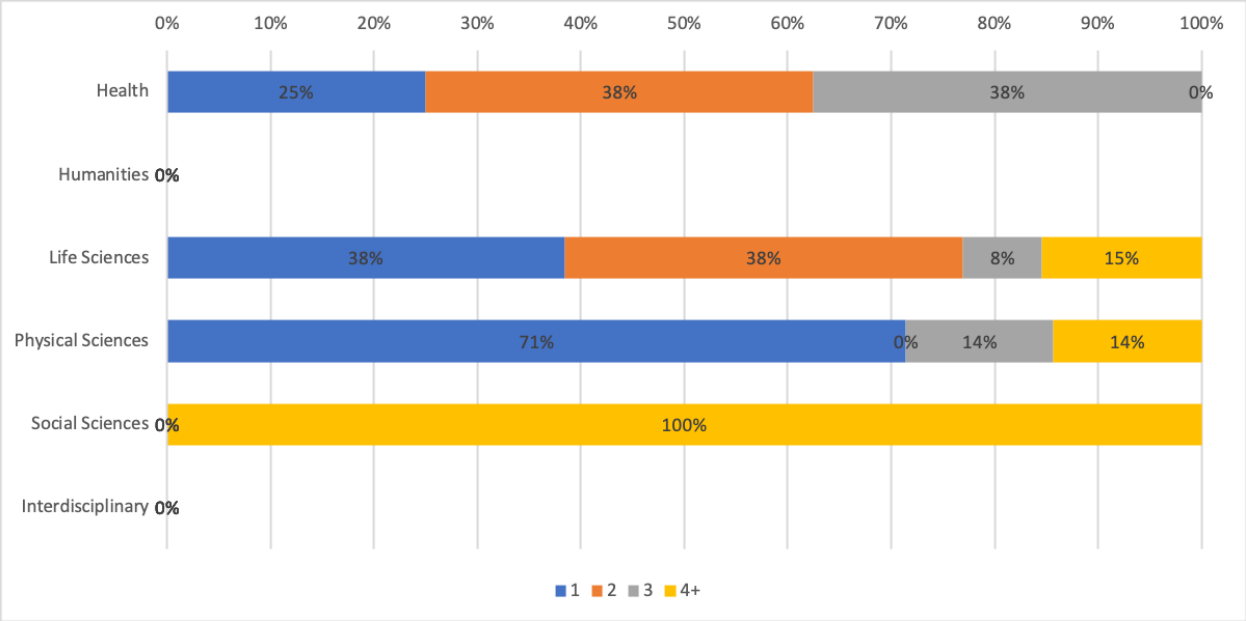


Figure 286: *How many federal fellowships/studentships have you applied for?* Successful awardees disclosed the number of federal grants to which they applied. (n = 8, n = 0, n = 13, n = 7, n = 2, n = 0).

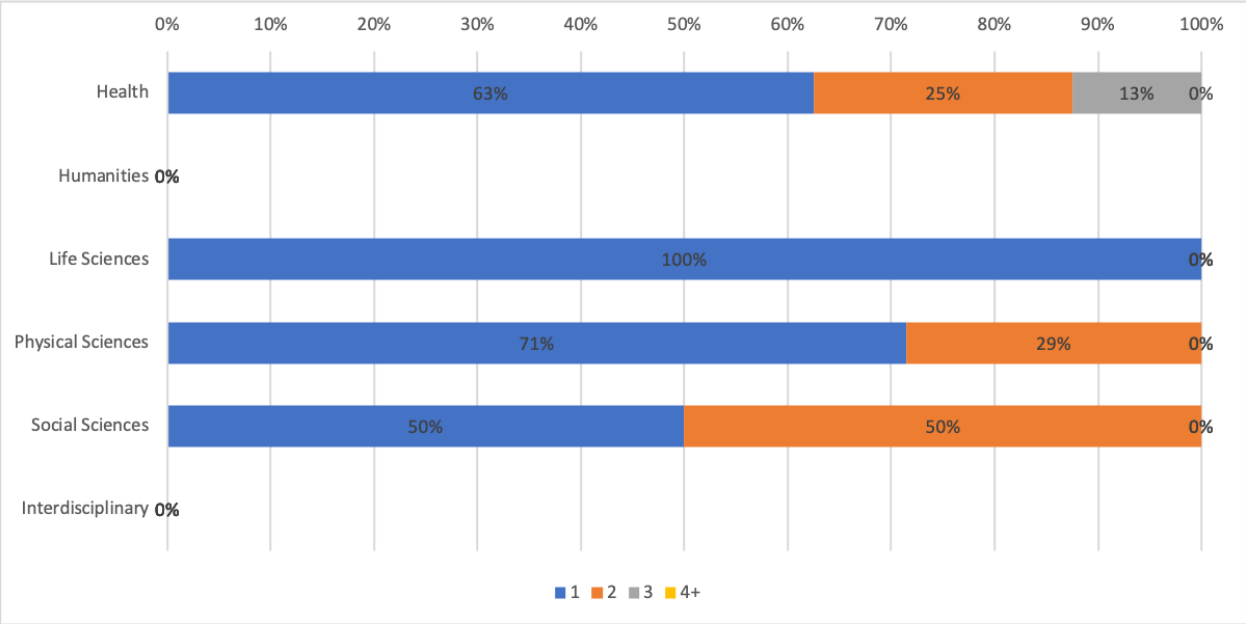


Figure 287: *How many of your federal fellowship/studentship applications have been successful?* Successful awardees disclosed the number of federal grants they received. The majority of international students only are successful in one of their applications (n = 8, n = 0, n = 13, n = 7, n = 2, n = 0).

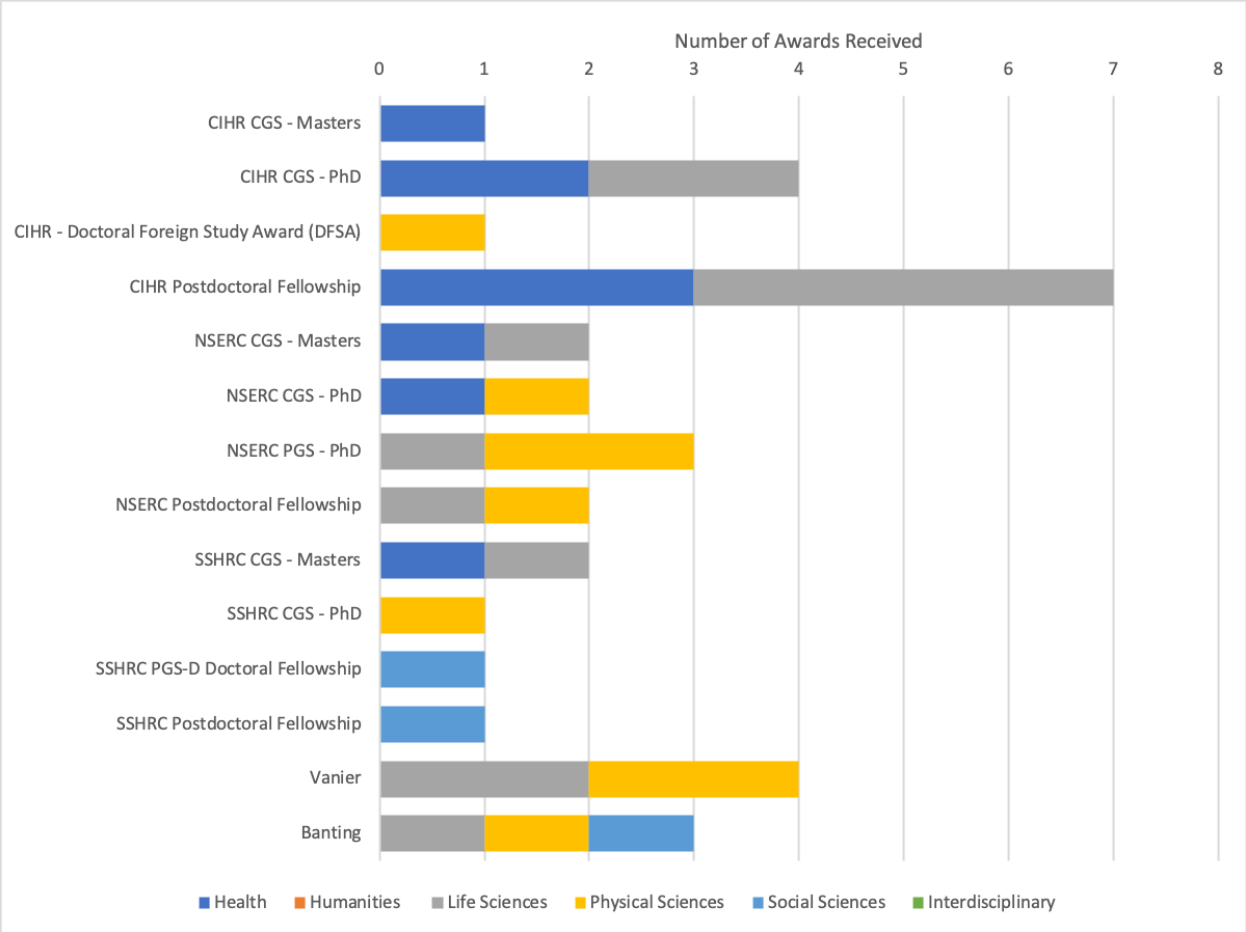


Figure 288: *Federal awards received.* Respondents noted which awards they successfully received, with more than one award per applicant possible (n = 8, n = 0, n = 13, n = 6, n = 2, n = 0).

Conclusions

In cross-analyzing the data of international students and postdocs, several patterns emerged. Those trainees in the social sciences and humanities typically perceived more strongly that there are few awards and resources covering their fields. 73% of international trainees in the social sciences strongly disagree that there are enough awards for international students/postdocs, with 87% of them agreeing that finding funding is difficult. International students and postdocs in the social sciences also confer that their field is not adequately represented by the federal granting agencies, and 41% strongly disagree that there are enough resources for international students/postdocs. Indeed, the largest number of international students that were unable to apply for federal grants were from the humanities and social sciences: only 1 international applicant from the social sciences received a federally-granted award. Thus, students in the humanities state that there exists an overall lack of incentives for international students to come to Canada, reflecting a huge gap in our funding ecosystem for these candidates.

Meanwhile, early career researchers in life sciences and health find competitiveness of federal granting agencies to be very high, with 47% of life science trainees and 43% of health trainees stating that remaining competitive in Canada was difficult. This may elude that the present evaluation criteria

of awards from respective granting agencies fail to consider institutional differences of countries other than Canada. This difficulty to remain competitive is reflected in proportionally fewer successful award applications to eligible students and postdocs in life and health sciences in comparison to those eligible to apply in the humanities.

Chapter VII: Final Conclusions

To date, Canada is recognized on the global stage as a research powerhouse. This reputation is in part owing to the talents and discoveries of young ECRs, many of whom depend on support from the federal Tri-Council granting system. To continue our trajectory of growth and solidify Canada's competitiveness in research and innovation, we must continue to reward excellence of our young researchers and invest in their development. With the present system, over 70% of participants, across all self-identified groups reported in our analysis, recommend increasing both value and number of federal awards for graduate students and postdoctoral fellows. Notably, ECRs value this government funding as clearly beneficial for academic prestige, as well as building their future careers in Canada. In addition to the efforts put forward in Budget 2019, we recommend, based on our survey data, that both the number and value of federal awards be increased to follow inflation and the recommendations from the Fundamental Science Review[12].

A large portion of participants also recommend reviewing the elite award system, including the Vanier and Banting awards. While these awards are highly prestigious, they allocate a large amount of funds towards a very small pool of young researchers. As standard government awards provide similar benefits and support, our respondents largely agree that these funds should be distributed more evenly across Canada's community of outstanding trainees. Notably, international students more strongly support the present elite award system, likely because this category of awards is one of the sole funding opportunities to which they have eligibility. Increasing international accessibility to standard awards would benefit Canada and attract more innovative international talent to academic and research-related sectors. We recommend that the elite awards are abolished, liberating funds for additional graduate and postdoctoral awards, and that other federal awards be made available to international applicants studying/training in Canada.

In addition to having more total awards, the structure of awards should also be reviewed. Indeed, it is clear that the marginalized groups in our analysis point out the need for additional benefits in the awards. Benefits suggested include the inclusion of healthcare coverage for international students, and increased support for spouses and dependents, called upon strongly in our data by women and non-binary respondents. Likewise, directing funding towards projects outside of the traditional siloes of academic research is strongly valued by marginalized groups: both Indigenous respondents and women voiced their high valuation of supporting multidisciplinary projects. Reviewing how funding is processed and used could not only benefit ECRs in general, but also specifically provide support to marginalized groups that face certain unique challenges. By capturing their point of view, we offer a window of opportunity for interventions that could be targeted at these groups in need.

ECRs are conscious of the employment reality that awaits them after finishing their academic training. Researchers often transition outside of academia for their career, either by choice or due to lack of opportunity. This transition is often difficult and a leap into the unknown for ECRs who

[12] Advisory Panel on Federal Support for Fundamental Science: "Fundamental Science Review, Investing in Canada's Future: Strengthening the Foundations of Canadian Research." https://www.sciencereview.ca/eic/site/059.nsf/vwapj/ScienceReview_April2017-rv.pdf/$file/ScienceReview_April2017-rv.pdf

mostly evolved in the academic sphere. All groups that were part of our analysis pointed out a need to include broader types of training into the academic curriculum, such as business and communication skills. These skills, supplemental to research training, will be beneficial to the ECRs who wish to join the workforce. Respondents also comment on the fact that the current award review system does not seem to reward community engagement, science outreach and impact-oriented activities. Indeed, these types of engagements show the dedication of a student and allow them to make their research accessible to a greater number of people. By including these skills in the reviewing process, the federal funding agencies will encourage students to broaden their palette of skills, thus preparing for their future career whether in or out of academia[13][14]. These concerns are particularly important to marginalized groups.

In order for Canada to maintain momentum and place itself as an international leader in scientific discovery and technology, the country needs to support the next generation of researchers. These ECRs demand more adapted funding opportunities that will support their research goals and their future careers. In a constantly moving world, multidisciplinarity and communication will be key skills for the most competent scientists. By tailoring the funding opportunities to the needs of ECRs, the government will also be able to support targeted marginalized groups, thus moving the country towards a future where EDI is at the heart of our research ecosystem. An inclusive Canada will be more productive, more competitive and more open. Building a fair and rigorous funding system to support the next generations of researchers will contribute in training the leaders of tomorrow and building a strong future for our country.

[13] University of Toronot School of Graduate Studies: "The 10,000 PhDs Project, University of Toronto." https://www.sgs.utoronto.ca/wp-content/uploads/sites/253/2019/06/SGS_Overview_10KPhDsProject.pdf

[14] The Conference Board of Canada: "Inside and Outside the Academy: Valuing and Preparing PhDs for Careers, The Conference Board of Canada." https://www.conferenceboard.ca/temp/de3739d1-8cf1-4a8b-8630-5f69881a6c32/7564_Inside and Outside the Academy_RPT.pdf

Appendix I: Methods

Data was collected using an online survey. The survey was open from October 9th, 2018 to January 15th, 2019 and was hosted as a Google Form. We received a total of 1,132 completed responses. The survey was made available to students, postdocs, and researchers in both French and English who currently or previously have studied in Canada. The survey was distributed to various university and research groups throughout Canada, using primarily online communications platforms as the dispersal technique (including email, Facebook, LinkedIn and Twitter). All registered Canadian universities were contacted for dissemination of the survey amongst their relevant constituents, via either faculty and/or department administration, or representative student unions and groups.

Appendix II: Survey Structure

Section 1. Student/Postdoc Status and Demographics

1. What best describes your situation?
   - Current student (Bachelors, Masters, PhD)
   - Current postdoc
   - Former student (Bachelors, Masters, PhD)
   - Former postdoc

2. Position and year:
   - Bachelors Y1
   - Bachelors, Y2
   - Bachelors Y3+
   - Masters Y1
   - Masters Y2+
   - PhD1
   - PhD2
   - PhD3
   - PhD4
   - PhD5+
   - Postdoc 1
   - Postdoc 2
   - Postdoc 3
   - Postdoc 4+
   - Finished studies/postdoc less than 5 years ago
   - Finished studies/postdoc more than 5 years ago
   - Other

3. At which university are you currently studying or completing your postdoc? Or, if you are no longer a current student/postdoc, at which university or institution did you complete your most recent degree or postdoc?
   - Acadia University
   - Algoma University
   - Athabasca University
   - Augustana University College
   - Bishop's University
   - Brandon University
   - Brescia University College
   - Brock University
   - Canadian Mennonite University
   - Cape Breton University
   - Carleton University
   - Concordia University
   - Concordia University College of Alberta
   - Dalhousie University
   - Dominican University College
   - École de technologie supérieur
   - École nationale d'administration publique
   - École Polytechnique de Montréal
   - First Nations University of Canada
   - HEC Montréal
   - Huron University College
   - Institut national de la recherche scientifique
   - King's University College at Western University
   - Lakehead University
   - Laurentian University
   - MacEwan University
   - McGill University
   - McMaster University
   - Memorial University of Newfoundland
   - Mount Allison University
   - Mount Royal University
   - Mount Saint Vincent University
   - Nipissing University
   - NSCAD University
   - OCAD University
   - Queen's University
   - Redeemer University College
   - Royal Military College of Canada
   - Royal Roads University
   - Ryerson University
   - Saint Mary's University
   - Saint Paul University
   - Simon Fraser University
   - St. Francis Xavier University
   - St. Jerome's University
   - St. Paul's College
   - St. Thomas University
   - TÉLUQ
   - The King's University College
   - Thompson River University

- Trent University
- Trinity Western University
- Université de Laval
- Université de Moncton
- Université de Montréal
- Université de Québec
- Université de Saint-Boniface
- Université de Sherbrooke
- Université du Québec à Chicoutimi (UQAC)
- Université du Québec à Montréal (UQAM)
- Université du Québec à Rimouski (UQAR)
- Université du Québec à Trois-Rivières (UQTR)
- Université du Québec en Abitibi-Témiscamingue (UQAT)
- Université du Québec en Outaouais
- Université Sainte-Anne
- University of Alberta
- University of British Columbia
- University of Calgary
- University of Guelph
- University of King's College
- University of Lethbridge
- University of Manitoba
- University of New Brunswick
- University of Northern British Columbia
- University of Ontario Institute of Technology
- University of Ottawa
- University of Prince Edward Island
- University of Regina
- University of Saskatchewan
- University of St. Michael's College
- University of Sudbury
- University of the Fraser Valley
- University of Toronto
- University of Trinity College
- University of Victoria
- University of Waterloo
- University of Western Ontario
- University of Windsor
- University of Winnipeg
- Vancouver Island University
- Victoria University
- Wilfrid Laurier University
- York University
- Other Canadian Institution: Hospital
- Other Canadian Institution: Private Sector
- Other Canadian Institution: Government
- Other Canadian institution: CÉGEP
- Other Canadian institution: Other
- Outside of Canada
- Prefer not to answer

4. How would you best describe your field of study (or most recent field of study)?
   - Health
   - Life Sciences
   - Physical Sciences, Mathematics, and Engineering
   - Social Sciences
   - Humanities
   - Other:

5. Where do you currently live?
   - Canada
   - U.S.A.
   - Other
   - Prefer not to answer

6. What is your current residency status? (This question will be used for statistical purposes only and to direct international students/postdocs to a follow-up question regarding their particular concerns)
   - Canadian citizen
   - Permanent resident of Canada

- International
- Prefer not to answer
- Other:

7. In what province/territory does your workplace institution reside?
    - Alberta
    - British-Columbia
    - Manitoba
    - New Brunswick
    - Newfoundland and Labrador
    - Northwest Territories
    - Nova Scotia
    - Nunavut
    - Ontario
    - Prince Edward Island
    - Québec
    - Saskatchewan
    - Yukon

Section 2. Equity information

Disclaimer: All questions are optional and will be kept anonymous. Choosing to self-declare will help to obtain statistical analyses of equity group in student/postdoc funding.

We have expanded on the Government of Canada Employment Equity criteria. You can choose to self-declare to help obtain statistical analyses of equity group in student/postdoc funding.

8. Do you self-declare as any of the following employment equity groups as grouped by the Government of Canada (*tick any that apply*).
    - Indigenous person (definition)
    - Persons with disabilities (definition)
    - Visible minority (definition)
    - Prefer not to answer

9. How do you identify your gender?
    - Man
    - Non-binary
    - Woman
    - Other
    - Prefer not to answer

10. What age category do you fall into?
    - Less than 18
    - 18-25
    - 25-30
    - 30-35
    - 35-40
    - 40+
    - Prefer not to answer

11. Are you a caregiver for a child, parent, or other dependent (*select all that apply*)?
    - Yes, for a child/children
    - Yes, for a parent(s)

- Yes, for other dependent(s)
- No
- Prefer not to answer

Section 3. Fellowship Application Experience (Barriers and Facilitators)

12. Have you ever applied for a graduate or postdoctoral fellowship through CIHR, NSERC, or SSHRC?

- **Yes**
- **No**

i. **If No:** What prevented you from applying?

- My international status prevented me
- My grades didn't meet the requirement
- Low publication record
- Lack of access to fellowship resources / information
- Other members of the lab applied making me ineligible
- Lack of support from my supervisor
- Other

ii. If yes (you applied): Please state to what degree you agree with the following statement: I received adequate resources to help me complete my application (e.g., supervisor/institutional help, writing workshops, etc..) (*Strongly agree, somewhat agree, neutral, somewhat disagree, disagree*)

iii. If yes (you applied): Please state to what degree you agree with the following statement: I received useful feedback from my application, whether or not it was successful? (*Strongly agree, somewhat agree, neutral, somewhat disagree, disagree*)

iv. If yes: Were any of your application(s) successful?

- **Yes**
- **No**

a. If yes: How many federal fellowships/studentships have you applied for? (*Drop down menu from 1, 2, 3, 4+*)

b. If yes: How many of your fellowship applications have been successful? (*Drop down menu for 1, 2, 3, 4+*)

c. If yes: Please select which federal award(s) you've received. (*choose all that apply*)

- CGS - Masters CIHR
- CGS - Masters NSERC
- CGS - Masters SSHRC
- CIHR CGS - D
- CIHR - Doctoral Foreign Study Award (DFSA)
- CIHR Postdoctoral Fellowship
- NSERC CGS-D
- NSERC PGS-D
- NSERC Postdoctoral Fellowship
- SSHRC CGS-D
- SSHRC Doctoral Fellowship
- SSHRC Postdoctoral Fellowship
- Other(s):

d. If yes: What impact did receiving an award have on you and your research?

- Ability to study without working outside of academia
- Ability to study without a Teaching Assistantship

- Allowed other opportunities such as networking, travel, conferences, purchase equipment for research, etc
- Reduce loans needed to be taken out
- Increased publications
- Other:

e. If yes: Did you require other sources of funding during the duration of this award?

i. Yes
ii. No
iii. Prefer not to answer

If yes: What type of support did you seek/receive (*select all that apply*):

- Used previous savings
- Loans
- Parental or family support
- Other scholarships
- Part-time employment
- Internships
- Other

f. If yes: In your opinion, your award helped prepare you for a career in: (*select all that apply*)

- Academia
- Industry
- Public policy
- All of the above
- None of the above
- My award did not help prepare me for a career
- Other:

g. If yes: Did receiving an award have a negative effect on your career or experience?

- No Negative experience
- Yes (please explain below)

Section 4. Future of Canadian fellowship

13. In your opinion, rate how much value you think reviewers should place on the following factors when evaluating awards applications? *(Where 1= highly value, 3 = neutral, and 5 = do not value,) (Values 1-5, no opinion)*

- Academic record (grades)
- Extracurricular involvement: Research-related (e.g., science/research communication, policy, community outreach related to research, knowledge translation)
- Extracurricular involvement: all other types (artistic contributions, entrepreneurship, volunteering)
- International collaboration
- Mentorship activities
- Non-academic publications (books, op-eds, blogs, white papers)
- Periods of leave (academic, parental, personal health, familial health, or other)
- Potential societal impacts of the research
- Prestige of the institution or of your supervisor
- Previous success with awards (distinctions)
- Previous success with scholarships and fellowships

- Project description / proposal
- Publication record
- Reference letters
- Societal importance of the challenge the research seeks to address
- Teaching / TAship

14. Are there any factors not listed above you think scholarship/fellowship reviewers should consider? If yes, please describe here:

15. What are the barriers or problems with current scholarship and fellowship opportunities? (*check all that apply*)

- Considerations for equity, diversity, and inclusion
- Support for Indigenous applicants
- Support for international applicants
- Support for multidisciplinary projects
- Work-life balance
- Support for dependents
- The duration of eligibility criteria restricted to early in your degree is too limited
- Portability
- Value of awards
- Number of awards given
- Different cities/areas have different costs of living whereas awards remain the same no matter where you live
- Other:
- None

16. Do you think your field of research is not adequately represented by the awards opportunities available from CIHR, NSERC, or SSHRC?

- Yes
- No
    - i.If yes, Which fields: ____

17. Do you feel there are benefits of obtaining funding from awards, rather than receiving support from your supervisor's research grants (or other indirect sources?) (*select all that apply*)

- Yes, because they provide salary security
- Yes, because they provide prestige and personal recognition
- Yes, because they provide a better salary (either from the fellowship or financially encouraged by supervisor)
- Yes, because they provide me greater control over my research project
- Yes, because of other reasons
- No, because I receive my stipend from supervisor's research grant.
- No, because of other reasons.
- Other

18. Do you feel that scholarships and fellowships should help to prepare trainees for diverse careers outside of academia?

- Yes
- No, trainees can find these resources elsewhere, such as through the university
- No, for other reasons
- Not sure
- Other

19. Are there other skills would like to see incorporated into training (as mandatory or optional)?

- Yes, business and finance skills
- Yes, communication to different audiences
- Yes, career development
- Yes, ethics and/or research ethics
- Yes, second language courses (English or French)
- Yes, management and leadership skills
- Yes, policy skills
- No, my current training is sufficient for all the skills I need and/or want
- No, even if my current training does not cover all skills I want, I can develop these skills through other means (eg volunteering, audit courses, etc)
- Other

The following information might be useful for the following questions:
Definitions:

- Elite award: Banting (postdoctoral level) and Vanier (PhD level) - higher value and require exceptional academic success and places a higher emphasis on leadership than standard awards.
- Standard awards: any CGS-M, CGS-D, PGS-D
  - CGS-M: Canada Graduate Scholarship - Masters
  - CGS-D: Canada Graduate Scholarships - Doctoral
  - PGS-D: Postgraduate Scholarships - Doctoral
  - PDF: postdoctoral fellowships of CIHR, NSERC, SSHRC (Excluding Banting)

Value, duration, and number of scholarships and fellowships awarded in 2017

		CIHR			NSERC			SSHRC		
		Value (yearly)	Number Awarded	Duration (Y)	Value (yearly)	Number Awarded	Duration (Y)	Value (yearly)	Number Awarded	Duration (Y)
PDF	Fellowships*	$45,000	158	3	$45,000	199	2	$40,500	151	2
	Banting	$70,000	27	2	$70,000	44	2	$70,000	51	2
D	PGS*	-	-	-	$21,000	390	3	$20,000	430	3
	CGS	$35,000	174	3	$35,000	329	3	$35,000	430	3
	Vanier	$50,000	57	3	$50,000	163	3	$50,000	166	3
M	CGS	$17,500	386	1	$17,500	788	1	$17,500	1280	1

PDF = Postdoctoral fellowships * portable to institutions outside Canada
D = Doctoral
M= Masters

20. Elite awards are:
    - Critically important
    - Important but not critical
    - Not very important
    - Not sure

21. Are elite awards a valuable part of the current funding system? (*check all that apply*):
    - Yes, because they provide prestige
    - Yes, because they encourage and reward excellence

- Yes, because they encourage competition
- Elite awards do not provide value
- Other:

22. Elite awards provide greater levels of support and prestige for select trainees, but the investment required reduces the total number of potential awards available. Considering this, pick a statement you most agree with:

- Even if it reduces the overall number of fellowships, the number of elite awards should be increased at the expense of standard awards to favour prestige and competitivity.
- The current system of elite and standard awards is as it should be.
- It is unfortunate there are less awards but necessary to maintain elite awards.
- Elite awards should be reduced (in number and/or value) but not abolished to favour standard awards.
- Elite awards should be abolished to favour standard awards.
- No opinion.

23. If there were an increase in the total federal budget for graduate and postdoc awards, please indicate how much you value the following: (*highly value, value, neutral, value a little, don't value)*

- Increasing value of all scholarships and fellowships
- Increasing value of elite awards
- Increasing value of standard awards
- Increasing value of all graduate student awards
- Increasing value of postdoctoral awards
- Increasing the value of specifically PGS-D Awards
- Increasing the total number of fellowships given
- Increasing length of awards
- Increasing eligibility time for awards
- Increasing the number of interdisciplinary awards
- Increasing the number of travel awards
- Increasing the value of travel awards
- Increasing awards for outreach/engagement activities
- Harmonizing value of awards across CIHR, NSERC, SSHRC
- Including skills or impact-oriented activities as criteria for evaluation for all awards
- Including reports to be filled out by awardees at the end of the award to track outcomes
- Include funding for peripheral support (e.g., health/dental benefits, EI/CPP, etc.)
- More support for awardees with dependents (eg childcare support for conferences)
- Increasing the number of awards open to international applicants

24. The value of current awards is listed here (put link for values). Keeping in mind funding limitations, what do you think are optimal values of awards for (*leave blank if you do not know*):

- Masters: _____
- PhDs:_____
- Postdocs:_____

25. Any additional comments

26. In generating our final report, we may use quotes from this survey anonymously to highlight specific student experiences. Check here if you would like to opt out of this (*Yes/No*).

Section 5 - International Students/Postdocs (only if answered 6 - International)

27. Rate how much you agree with the following statements (*strongly agree, agree, neutral, disagree, strongly disagree, no opinion*)

- Information on awards for international students/postdocs is easily accessible.
- There are an adequate number of awards for international students/postdocs.
- There are not enough awards for international students/postdocs.
- There are adequate resources to help access and apply for awards for international students/postdocs.
- The value of awards is adequate.
- Specific incentives for international students are lacking (specific awards, specific reduction of certain taxes, etc.)

28. With respect to choosing to study/work in Canada, how easy/difficult you found the following (*very difficult, difficult, neutral, easy, very easy, no opinion*)

- Finding reliable information
- Finding funding
- Applying for federal awards
- Being competitive (criteria of research excellence in canadian awards is different from the country(ies) where I previously studied)
- Immigration procedures
- Bringing spouse/partner/dependents (immigration issues)
- Ability to supporting dependents once arrived

29. Do you have any other specific concerns as an international student or postdoc?

Appendix III: Table of All Universities

University/Institute	Number of respondents
Acadia University	1
Athabasca University	1
École de technologie supérieur	1
Mount Saint Vincent University	1
University of Northern British Columbia	1
University of Prince Edward Island	1
Other Canadian institution: Other	2
Prefer not to answer	2
Université de Québec	2
Université du Québec à Rimouski (UQAR)	2
Université du Québec à Trois-Rivières (UQTR)	2
Université du Québec en Outaouais	2
University of Regina	2
Brock University	3
Carleton University	3
Institut national de la recherche scientifique	3
Trent University	3
Université de Sherbrooke	3
Other Canadian Institution: Government	4
Ryerson University	4
University of New Brunswick	4
Wilfrid Laurier University	4
York University	4
Université de Moncton	5
Other Canadian Institution: Hospital	6
University of Waterloo	7
University of Manitoba	9
Dalhousie University	10
University of Windsor	10
Simon Fraser University	11
University of Calgary	11
Université du Québec à Montréal (UQAM)	12
Memorial University of Newfoundland	14
Queen's University	14
University of Victoria	14
University of Ottawa	15
Université de Laval	27
University of Guelph	28
Concordia University	33
University of Western Ontario	37
McMaster University	38
Université de Montréal	49
University of Saskatchewan	51
Outside of Canada	53
University of British Columbia	55
University of Alberta	82
University of Toronto	119
McGill University	354
TOTAL	**1119**

Appendix IV: Quotes and Stories

Subsection A: International Students and Postdocs' Perspectives

Do you have any other specific concerns as an international student or postdoc?

Comments include:

- Lack of support and available information for both immigration and funding
- Immigration is expensive (work permit, health insurance etc)
- Hard cliff of the 5-year postdoc rule
- Lack of funding opportunities
- Available funding are too restrictive (only certain field, only first 1 or 2 years of postdoc)
- Funding terms too short
- Permanent residency as a milestone for funding opportunities
- International applicants at disadvantage when GPA taken into account

"Even if there are some scholarships available, **I am not in the same ranking**. So if there are, for example, 50 scholarships for Canadians or permanent residents, only 2 are for foreigners, even if we do research right here in Canada!"

PhD student, University of Toronto

"[There are] barely any funding opportunities. Renewal of **study permits** plus CAQ (Quebec Acceptance Certificate) [are] **expensive** with a grad student stipend. We also pay compulsory **health insurance** which is over 1000$ per year and is not taken into account while equalizing stipend to that of domestic students."

PhD student, McGill University

"It is very difficult to arrive in Canada [due to] a mix of social, financial and immigration status. The **information is usually scattered or hidden, and international students are often exploited in daily life** (higher rent, negotiating in shops, higher prices at university). After a while, we get used to this, but it makes the whole journey of graduate school more difficult."

PhD student, McGill University

Universities tend to not address the most important concerns of international students/PostDocs appropriately. Before international students can care about their academic life and joining social activities on campus, they **first need to get reliable information about health care/insurance, funding (when and how), immigration status, SIN**, etc.
I do think this is the responsibility of the student to get this information, but universities could help to provide this information in a more accessible way and be consistent in the information they are providing [...] "

PhD student, University of Toronto

"**The hard "cliff" at year 5 when you can no longer be a postdoc is awful**. It pushed several good people out of my lab and nearly forced my wife to move back to the US. There should be prolonged status--and funding--for non-independent researchers regardless of their time since degree.
On the immigration front, the actual procedure was easy. Finding that out, however, took a ton of work on my own. McGill should have been able to tell me exactly what to do and how to do it.

To be fair, subsequent renewals have been a lot easier, but the initial application was needlessly nerve-wracking."

Postdoc, McGill University

"Many science based international PhD students are extremely busy with coursework and experiments. This is in addition to meetings, writing papers or manuscripts, and preparing for conferences. Therefore when applying for funding, there is not a lot of time for students to devote to identifying the best routes for funding. For international students, the types of funding available are not always clear and the amount of awards is considerably fewer. For one, I am concerned with the **lack of funding** and second, I am concerned that **the information on what is available is not clearly explained and advertised to international students**."

PhD student, McGill University

"**Many programs** for international students and postdocs target specific geographies or areas of study, are available only for the first year or two, have significant procedural barriers for nomination and application, are not offered on a rolling basis, are insufficient given the length of study or process of application or otherwise **present too many limits and constraints** to be broadly accessible and sufficient."

PhD student, McGill University

"**Funding terms of 1-2 years are too short** which means I have to keep renewing my work permit and reapplying for funding which means I am doing paperwork, not research."

Postdoc, Concordia University

"The sheer amount of funding, especially at levels below PhD, is negligible compared to what is available to domestic students. As international students we are **already strapped for resources because we don't have employment/family support available and moving to a different country** costs a *lot* of money. Plus, many of us are paying extra tuition and other fees as international students. We need more opportunities to focus on our research rather than worrying about how to support our basic living expenses."

Master's student, Simon Fraser University

"International students leave their home countries and embrace significant lifestyle changes to pursue research that also benefits their host Canadian institution and Canada, yet there is a general lack of federal funding opportunities for international students. This is very disappointing and I warn prospective international students about this. The **federal government should support** and incentive international students with **more international student funding** opportunities, **removing permanent residency restrictions on current funding**, and/or by facilitating a **fast-track to permanent residency (<2 yrs)** for international students to make them eligible for more funding opportunities.

Additionally, major federal scholarships (e.g. Vanier) that are partly merit-based and open to international students should **waive the undergraduate GPA from the application, or require proper translation from an applicant's home university to their graduate Canadian university**. Otherwise, this could place applicants who had a more stringent undergraduate grading system at a substantial disadvantage."

PhD student, University of Alberta

Subsection B: Regarding Scholarship Review Processes

Are there any factors not listed above you think scholarship/fellowship reviewers should consider? If yes, please describe here:

Comments include:

- Lack of support and available information for both immigration and funding
- Lower economic class at disadvantage for financial support, ability to perform unpaid volunteer work and familiarity with university community and funding processes (similar to first university generation)
- Lack of proper training dedicated personnel
- No opportunity for students to justify/explain challenges potentially faced with previous supervisors/employers
- Insufficient focus on science communication and knowledge translation of findings
- Fundamental research should be valued as much as applied research and metrics adapted
- For award applications evaluation, value should be given to
    - clinical practice in fellowships for health science field
    - extracurricular activities (building skills)
    - work-life balance and stress management
    - non peer reviewed productivity products should be rewarded (like patents, industry related projects milestones, etc.)
    - the narrative of why somebody pursues such career/field/research
    - science communication and knowledge translation
    - career and life challenges that the applicant may have overcome
    - improvement and/or maturation over time (as predicting success)
    - cultural differences for international (reference letters more modest outside of North America)
    - non-linear career (different labs, fields, country as well as employment including non-academic jobs)

"**Alignment between research proposal and the resources** available to the student or postdoc (i.e. explicitly stating how the applicant will take advantage of resources in their lab or institution, as well as those of local and international collaborators). Also, it would be very insightful to include a space for applicants to note what **skills and experience they expect to learn** over the course of the award and the project they are proposing - this should be considered as a **high value metric**."

PhD student, McGill University

"Some way to **measure work-life balance, or ability to manage stress and take care of oneself**"

PhD student, University of Waterloo

"Socioeconomic class - not everyone has the time to engage in extracurricular activities or research activities unless they're paid. I needed to take on jobs in my spare time to pay for undergrad. Adding to this, there are people who get familial help with applications or just familiar with the language of these things, however many coming from **lower socioeconomic conditions are the first generation in their communities exposed to this and they can be**

at an inherent disadvantage unless they are given guidance. Please somehow take this into consideration."

PhD student, USA

"**Extracurricular** pursuits that require a **high degree of perservence and/or dedication** (ie. High level sport or music) should be valued highly because those attributes are important to succeed in research. [...]"

Postdoc, University of British Columbia

"**Productivity that did not yield publications**, I.e. patent work, industrial work, etc. How that can be documented would be difficult but necessary"

PhD student, McMaster University

"Support within the lab (ie. designated personnel to train students). This should be fully outlined for every grant/scholarship application to ensure students are appropriately trained. **Sink or swim does not foster future scientists**."

Master's student, University of Toronto

"I do think the narrative given is important. Maybe it's clear from the application that the person is very passionate about science and has a long commitment to the field. Maybe they just changed into a field but are really enthusiastic to start. We need all kinds of minds in research, but I would like to think the **'why' of someone wants to pursue something is important**."

Postdoc, University of British Columbia

"Evidence of **critical/innovative thinking**. For health sciences, ongoing involvement in clinical practice - requirements of award often put those who remain actively involved in clinical practice at a disadvantage. The integration of **clinical practice** and academic pursuits should be encouraged and rewarded. While this may occur within medicine, the clinical and academic systems within nursing and other allied health professions make this integration less feasible. However, this integration is critical for the design of research that addresses real world problems and for expediting knowledge translation. The application process should provide opportunity to articulate if and how this integration is being fostered by the applicant."

PhD student, McGill University

"There should be **several different types of awards with very different criteria**. Certainly, people who were very successful in grad school should be rewarded for that, but there's also a "Matthew effect", where past success doesn't just predict it, but actively causes it. However, academic success is pretty random, and depends on the environment, supervisor, and luck. Therefore, I would also like to see a **subset of awards that are driven solely by the project, outreach activities**, etc."

Postdoc, McGill University

"Non-academic employment! I am surprised and very annoyed that that isn't included in the above question. People in research/academia do not seem to understand that **most students today need to work outside of school to make it through** the duration of their studies, even if it's only for certain years. Non-academic employment, i.e. supporting yourself when your family or scholarships aren't enough to support you, should be valued, probably not "highly", but more than "a little".

PhD student, McGill University

"**Writing reports for industries** should have as much importance as publications, because, in certain cases, they can take as much time to prepare. Working on a **multidisciplinary project** should also bring a lot of value to the application, because graduate students working on a research project that involves **industries, government agencies, universities, and first nations** are likely to have a lot more work to do to explain/present the results to each of the different groups, and the student might be the point of mediation between the different groups."

PhD student, Queen's University

"Opportunities for students to justify/explain **challenges** potentially faced **with previous supervisors/employers**."

PhD student, Concordia University

"I think "Extracurricular involvement: Research-related" is extremely broad. There is **insufficient focus on science communication and knowledge translation of findings**. If you lump it together with research itself, it's not really demonstrating impact. I understand if projects take a long time to see results this is more difficult, but engagement with the community about science is undervalued because it's together with research output itself. There is very little consideration of this right now!"

PhD student, McMaster University

"**Career and life challenges** that the applicant may have overcome, other than periods of leave. For example, living with a disability, coming from a low-income household, being the only person in their family to have attended university, being an Indigenous person dealing with the legacy of the residential school system."

Postdoc, University of Calgary

"**Improvement and/or maturation over time, which shows one's ability to succeed**"

Master's student, McGill University

"Reviewers should know that **reference letters from former supervisors outside North-America are very modest**. Reviewers should take that into account when comparing such references with those applicants whose references are from North-America."

Postdoc, McGill University

"**Industry experience and soft skills** that allow to know better the applicant as a person, to get a sense of how well he or she will make the best of the scholarship and also it would be good to know if he or she is **in economical need** as a factor to prioritize"

Master's student, McGill University

"**The number of times an applicant has switched labs/institutions** - staying at the same institution would likely results in higher continuity but might mean a narrower network. For example, continuing as a PhD student in the lab where one's undergrad thesis was completed would likely produce a publication much earlier compared to someone who has switched supervisors and especially institutions."

PhD student, University of Toronto

"Extenuating circumstances and the need for funding (disadvantaged, low-income, first-generation students)"

PhD student, University of British Columbia

"**Non societal impact of the research. Basic research** leads to discoveries that are eventually incorporated into translational research where the benefits to society are realized. So it is important to consider both for funding."

Master's student, McGill University

"**Project rigour**, which should be evaluated by an methodological expert (i.e., quantitative expert reviews quantitative project, qualitative expert reviews qualitative project)"

Master's student, McGill University

"I think funding bodies need to take into consideration how much an individual is balancing in order to complete their graduate program and other activities. If they are highly active in a variety of areas this may be an indication of motivation and investment. **Unfortunately the field of research is not created equal and it is difficult to assess so many different people and projects on a universal scale**. More opportunities should be available for untraditional research areas as well or projects which may not fit exclusively under one funding body."

PhD student, University of Guelph

Subsection C: General Comments and Stories

Comments include:

- **Postdocs fellowships package is very poor** (taxable fellowship, no health benefit) and the eligibility criteria are very narrow (no possibility to reapply, only possible for first years). This is depicted as a not an "appealing" position to be in. "*The current earnings are demeaning, demotivating, and are not competitive to retain quality researchers"*
- Awards should at least **cover the living cost** even at the Masters' level.
- Awards should be **competitive compared to industry and other countries** to retain talents in Canadian academic ecosystem
- Living costs to be considered to be at the very least above poverty line (city level, country level)
- More awards to fund more students
- Abolish elite awards and harmonize award values to avoid creating toxic working environment with an absence of pay equity
- Extend duration of awards (especially postdocs)
- Health care professionals appreciate have the option of applying for fellowships as doctoral students
- Standardize the review and scoring process as well as making sure to avoid conflict of interest
- Promote multidisciplinary research
- Harmonize how universities see tri council awards: receiving such awards should have financial value (and be an absolute gain) in favor of the student – not the university.
- The funding ecosystem puts caregivers at disadvantage.
- Include other criteria of research excellence than peer reviewed publication and marks such as industry reports, outreach activities etc.

"I think we need to consider (1) **living costs**, and (2) **comparison with other countries to prevent brain drain.**"

PhD student, University of British Columbia

"Our department increases our stipend if we get a considerable but not small scholarship (> $5000). So those questions are meaningless since the answers depend on the university departments scholarships/stipend regulations"

PhD student, University of Toronto

"Generally, I think **more awards should be made available to more people**, and value adjusted where possible to increase the number of awardees, and overall provide enough to live off of, by removing [the] distinction between the 2 levels of doctoral or PDF awards, and **removing elite scholarships**. More graduate students' efforts should be rewarded rather than funneling funds towards a select few."

PhD student, University of Western Ontario

"**Master's awards currently do not support minimal cost of living in major Canadian cities**. They should be at least enough to support the student's living expenses in cities like Toronto and Vancouver with explosive rent pricing. **Postdoc fellowships should be competitive with**

industry to maintain early researchers on their academic track without personal finances being an issue. These fellowships support our incoming career researchers."

Master's student, University of Toronto

"**More awards is the way to go to enable as many trainees to get the opportunity to train in research labs and propel Canadian science**. PIs can supplement, which is feasible. But it's hard to pay entire salary for all students/postdocs from operating grants (almost impossible these days)."

Postdoc, University of Toronto

"Most important, to me, is to **extend the number and duration of awards, particularly for postdoctoral awards.** The current 2 years is insufficient for most projects to complete, which makes for a very difficult timeline (including designing study, collecting data, analysis, writing) while also looking/applying for the next job/fellowship and juggling family life."

Postdoc, University of British Columbia

"It's difficult for new students who don't have a history of publications or outstanding grades to apply for funding, which then puts more financial pressure on to them, impacting their studies. Funding should be at least be above the poverty line. **One of the reasons why I chose an international institution was receiving a scholarship that guaranteed funding for all years of my study, and to live independently with careful budgeting. I didn't have that financial security from the Canadian universities.**"

PhD student, USA

"The PDF fund for post docs is extremely unfair. You can **only apply once** and the **funds are taxed**. Post docs also **don't receive any health benefits**. For such a prestigious award and a hard to achieve award the funding package in the end is not that great. And if you were unsuccessful it is ridiculous that you can't apply again. There is already so little funding opportunities for post docs in Canada. Most of the post docs I know end up going to the US. Post docs can be the most productive researchers but they are the most expensive to supervise. Canada needs to be doing more for post docs."

PhD student, York University

"**Studentships and stipends have remained the same while tuition rates have increased, inflation has occurred and the basic minimum wage has also increased**. These awards should as well."

PhD student, University of Manitoba

"PhD students provide essential, highly qualified work for 4+ years, they should not be forced to live on the fringe of poverty or decide between finishing the degree and (potentially never) having children. An MSc is much more doable on a tight budget. **Postdocs should not be paid less than 60k, since they have a doctorate and already spent years living under the poverty line and accumulating debt**. Anything less demoralizes and eliminates talented researchers who do not receive funds from family/ trust funds/ inheritances etc. **Current funding levels are literally unlivable**."

PhD student, McGill University

"Some fields require students to leave the country for their PhD. It's unfair that students then get to take a much lower scholarship amount for outside of the country. Perhaps a **country by country multiplication factor** should be included **because living costs** are different in each country. The United States is far more expensive and so 21,000 is not merely enough. On top of

that, there should be no restrictions on who can take a postdoc scholarship in another country. Yes, the PhD student has gotten their degree in another country, but requiring them to come back to a Canadian institute for the postdoc severely restricts students in new and emerging fields. Also, from my understanding this was absolutely not how things worked roughly 15 years ago."

PhD student, USA

"Biggest change would be to **eliminate Vaniers/Bantings and put the money into general awards**; there is currently **too much of a discrepancy between lab mates** who are working on the same project, have the same background and degrees, but have a pay difference of $20K or more. More students could be supported at higher levels of salary; award values haven't increased over the years, and should at least provide minimum wage for a 35 hr work week."

Former postdoc, University of Alberta

"**The value of the award for someone pursuing their research outside of Canada** should be increased. Benefits, particularly health insurance for those abroad should be included with all awards."

Postdoc, USA

"Values of awards need to be increased to pay a fair wage to the people who actually do the research in Canada. **In the Life Sciences, PhD Students and Post Docs are treated like employees whose purpose is to advance their Principle Investigator's career and the prestige of the university, and so they should be remunerated as such**. They should also be given **benefits** commensurate with such a position, preferably to be administered by the university. For the same reasons, the federal government should mandate an end to tuition fees for graduate students, or at the very least a phase-out of these fees by the 2nd or 3rd year of study."

PhD student, McGill University

"PhD and Post-Doctoral scholarships are especially important given the increasing average time to completion. **It is a significant chunk of your life and this must be accounted for in the compensation package**."

PhD student, McGill University

"Graduate students are often still required to pay tuition - **my CGS-M award was basically cut in half after paying for my program**. This was not enough money to live off of, and was even worse in second year, when the funding was finished."

Master's student, McGill University

"**The low value of postdoctoral fellowships complicates my ability to apply at my current institution in the United States because it does not come close to the minimum salary requirements** (~48000 USD), and US federal grants place specific restrictions on providing funding for work covered from other sources (i.e., it is an administrative challenge to make up the difference from my supervisors' funding)."

Postdoc, USA

"**Canada is one of the few countries in the developed world where post-docs earn less than average wage**. Considering the hours of work put in, compensation for post-docs may even be below minimum wage considering the 8-10 years of training from undergraduate to graduate school. Graduate students living in Toronto do not earn a livable stipend and either must receive additional assistance or live on borderline poverty. Many student, post-docs I am

acquainted with, and I are under the impression that **we are being taken advantage of without receiving adequate compensation**."

PhD student, University of Toronto

"**I appreciate that health care professionals have the option of applying for fellowships as doctoral students** - I do think this is critical, as most are foregoing a good salary as a healthcare professional to pursue further studies. They bring that clinical and professional experience to their work, and this should be acknowledged. This integration is critical, as discussed earlier. If we want to have health care professionals pursuing research careers, and educating the next generation, the financial impact must be lessened. For instance, there is a shortage of doctoral-trained nurses to fill faculty positions."

PhD student, McGill University

"The value of the scholarships should be sufficiently high to motivate students to apply for them. Currently, there are a lot of graduate students who depend on secondary sources of income in order to be able to afford their increasing living expenses. That being said, the funding agency should focus more on **increasing the value of the scholarships, not so much the amount of scholarship awarded. This to maintain a highly competitive selection process that will increase the prestige of the award."**

PhD student, University of Toronto

"There is quid-pro-quo within the review/evaluation circles, all agencies must increase their efforts substantially to find **COI to protect the integrity and ethics of the review system**."

PhD student, University of Toronto

"To be useful, awards must **cover the value of full salary and take into account the cost of tuition and cost of living in particular regions of the country**."

PhD student, USA

"It is really neat to learn about the awardees of the Banting and Vanier scholarships and the research they are doing, but they do have an elite aura to them, and **distributing these awards to more people could definitely be beneficial**.
I have thought a bit about funding since I am a grad student and that is currently what I use for living expenses. During my degree, I did not have to worry too much about funding, as my supervisor has funded me through his grants. However, I did not receive too much help or encouragement in applying for an NSERC scholarship or other outside scholarships. I was encouraged to apply for NSERC, and received help with my application, but did not receive regular guidance or advice (which is understandable given my supervisor's limited time). The University did offer a variety workshops about how to write a proposal."

Master's student, University of Waterloo

"**The academic requirement and the way it is calculated for graduate students prevents many students from being eligible for scholarships**. For example if a student did a 2.5 yr masters, and obtained a B in their final year and had no courses the year before (because they did all courses in first year), the student average is a B and is therefore ineligible to apply for PhD scholarships. Either look at all the years in the graduate program or do not focus on academics that strongly."

PhD student, McMaster University

"**I do not believe in the elite award system**, I think it would be better served to offer more standard scholarships to graduate students, especially given the current ratio of low success rate vs. rather time consuming application."

PhD student, University of Toronto

"**Standardize the way referees determine what is considered a high score in certain criteria like publications and references** (taking into account the field of research, project scope, and other situations)."

PhD student, McMaster University

"The approach of setting a standard amount per level of training to me is an outdated concept. I think the **circumstances of each applicant should be taken into account**. Someone living in a high-cost city with multiple dependents should be receiving more support."

PhD student, University of Western Ontario

"I think it's particularly important to create a **multi-disciplinary category**, as a current student and former administrator I can say that there are many students that will modify their projects so it fits the agency. Also, students shouldn't be judged on their choice of agency or supervisor!!"

PhD student, McGill University

"I have benefited greatly from the current system (thank you for the funding!) but that doesn't mean it is optimal.
1) I have seen way too many highly skilled researchers fall short of getting funding during their degrees because of low undergrad GPAs or low publication records (usually because they decided they wanted to do research later in their journey). **So, although it is complex and difficult to find good metrics for success, the current metric of publications and GPA might not be the optimal way to judge applicants**
2) I have been funded by NSERC since my second year of undergrad and I had to pinch pennies to survive and, even then, required other financial aid. Also, I was a single person with no dependents. I think a **baseline level of funding should allow students to live (I.e., pay tuition and rent and buy food)**."

PhD student, McGill University

"It may be interesting to **allow higher level awards (CGS-D vs. PGS-D) to still be given to students going to foreign universities, perhaps with some pledge to return to Canada**. It's not as if students at foreign universities will no longer contribute to Canada - they don't become non-citizens."

PhD student, USA

"Outside of awards, Canada should increase the minimum postdoc salary to AT LEAST 45k. **The current earnings are demeaning, demotivating, and are not competitive to retain quality researchers**."

Postdoc, Queen's University

"Awards and funding for students should allow them a **decent standard of living** without the fear of not knowing how they are going to pay for their next dinner.
Awards should depend on the **cost of living** of the city the student is living in.
Professors use grants as a guideline on how much they pay graduate students without scholarship or award. By increasing the value of awards, the overall student stipend would grow and become more competitive internationally. Graduate student (in the field of physical sciences such as atmospheric and oceanic sciences, physics, geophysics, etc.) are

flexible and mobile. Canadian universities compete with their counterparts in the United States and Europe. Awards, scholarships, funding, and salary there are higher and may become the deciding factor for talented applicants to further their education outside Canada."

PhD student, McGill University

"**Some departments, including those at the University of Toronto, may adjust their base funding packages as a function of the awards students receive**. I think the government will have to work with the school itself - increasing the award value may end up reducing our overall base funding package, such that this helps the school rather than the student."

PhD student, University of Toronto

"The most important factor on the ground is that **different universities handle award-payments differently**. The University of Toronto funds students at $17,500 a year (already very low for the high cost of living in Toronto); UofT removes this funding if the student gets a tri-council award, effectively taking the full value of the award away from the student into UofT coffers. The student gets the prestige, but still has to TA, still has to worry about other funding, and with the cost of an apartment in Toronto, still has to worry about being able to afford room and board.
In contrast, York University funds students at $25,000 a year in the same city. At York, if students get a tri-council award the student gets the full value of the award, though York reduces their funding to $20,000 (still higher than UofT).

For a $17,500 CGS-M that means that a UofT student with or without the award lives off $17,500 regardless of award-status. A York student with the same award would get $37,500. When income is so low and living-expenses are so high (in Toronto) this disparity makes a massive difference. UofT should be stopped from taking away the award money in this way, essentially pocketing the government's money. A recent independent review of UofT's Psychology graduate program recommended they increase funding, and putting restrictions on what universities do with awards would be a major way to handle this problem. Policy could be amended to indicate that university base-funding cannot be removed from a student based on their successful application for a tri-council award. This would be a huge step forward, and one that a union cannot make; in this case, change has to come from the top.

PhD student, University of Toronto

Unrelated, I think the tri-council awards should take into account **open-science practices** and (if they have not already) **mandate that research performed under the grants must follow open science**. Specifically, pre-registration, open materials, open data, and open access publishing. This is another case where change must come from the top. The European Union recently mandated an open science policy with their grants and that decision is poised to change the face of research and of scientific publishing."

PhD student, University of Toronto

"**As a mother of young children I feel I'm disadvantaged in applying for awards, and will be further disadvantaged when I complete my program because I could not compete with younger individuals as a graduate student**. My research may be more important than my competitors but there are not enough hours in the day to put into applications for awards to win the competition."

PhD student, University of Alberta

"The more complex and involved the application process for awards is, the more likely it is that awards go to students who have fewer impacts on their time. If you are working, parenting,

taking a heavy course load, or volunteering the effort to submit these applications is higher. **Having excellent skills at applying for funding does not equate to having the skills to develop and deliver research projects that will improve our society.** If the application/review process were less onerous, and the awards were smaller, it would make pursuing graduate studies more equitable."

Master's student, University of Alberta

"PhDs and Postdoc positions generally function as full-time jobs. Researchers who are dedicated to doing tremendous work within Canada have to fully commit their time into the project. The awards (which are provided to people who have been judged on the quality of their research and deemed outstanding) should reflect a livable yearly salary. **It is unfortunate when a researcher with outstanding potential and self-motivation is forced to look for additional jobs that detract from their time spent researching**."

Master's student, McGill University

"Currently, awards are primarily won by those who have received financial rewards in the past. **Further emphasis should be placed on academic merit and the importance of the proposed study to its respective field and the broader scientific community**."

Master's student, Windsor University

"**Elite awards and the low number of regular awards given leads to huge differences in graduate and PDF level funding that breeds toxic environments**, especially in areas where the cost of living is incredibly high and graduate student stipends haven't gone up in the past 10-20 years. There are graduate students buying boats while others can't afford to eat. There is also a **distinct lack of transparency with how awardees are chosen at both university and federal levels**. Top researchers say they don't know how "elite" awards are distributed at the federal level, and universities are plagued by politics when distributing between departments. Additionally, **as graduate student awards are non-taxable and post doctoral awards are, it leads to post doctoral trainees making less than many graduate students**. Canada's funding and awards systems are broken, and are far behind leading research countries. If Canada wants to be competitive, they should show it and not just say it."

PhD student, University of Victoria

"There is too much value in the PhD-level awards placed on publications, and not enough on other aspects of research. Within the first two years of a PhD students often do not have many publications, if any, but have **other excellent research experience** that is not valued in these applications."

PhD student, McGill University

"I believe there should be less awards and larger grants for professors to administer as they see fit. Further, the amounts that students and post-docs are paid is tragic because they are not proper salaries for highly educated individuals to aspire towards. To make research more competitive in Canada, I believe that **stipends should be significantly higher and careers outside of academia, once graduated, encouraged**. Better overall funding of research should also encourage labs to purchase high-quality reagents and equipment rather than cutting corners and higher salaries will encourage more competition for available positions and lead to more productive work/research."

PhD student, McGill University

"**Awards should be a mark of achievement, not means for lab funding, tuition, or stipend which should be covered by the university/PI**. **It should aid you in your research/career**

development, material you can buy without going through PI, and small increase in stipend if you can get one of these prestigious awards."

PhD student, McGill University

"The application process is not only onerous for award-seekers, but demanding for the mentors and HQP supporting the seeker (prospective supervisor, reference letter writers, etc.). Given that many applications are unsuccessful, **tri-council must recognize the contribution it is making to wasting a great deal of collective time of Canada's most educated and productive researchers on essentially fruitless make-work activities**. Tri-council (and all scholarships and granting) should move to a **multi-stage process** whereby after a brief initial screening, a shortlists are invited to provide a full application. This would also result in much more efficient use of the granting agencies' resources, particularly peer reviewers."

Postdoc, Government institution

"The system places a high value on marks. Especially from the undergrad side. I think there are several scholarships that place the value on experience and also your proposal. If the proposal is not great then we aren't challenging that individual. So there needs to be a lowering if the required grades in my opinion even though those numbers are easier to assess. It just doesn't make sense that it makes up a huge chunk of the application."

Master's student, University of Guelph

Appendix V: Authorship & Contributions

Contributors, listed in alphabetical order

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Detailed contributions

1. Formal Analysis
2. Data Curation
3. Writing - Original Draft
4. Writing - Editing and Review
5. Conceptualization
6. Investigation
7. Visualization
8. Methodology
9. Software

* Supervision