Ithaka S+R | Group of Eight
Survey of Academics
2013 - 2014

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About the Project

Ithaka S+R's surveys of academics have been fielded in the United States, the United Kingdom, Canada, and New Zealand to analyse research, teaching, and information usage practices. Individual institutions and groups of them use the survey (alongside a companion survey of students) to assess the needs of the academic community in order to develop appropriate strategies and services. Five members of the Group of Eight (Go8) consortium participated in an Australian pilot of the Ithaka S+R faculty survey in 2013 and 2014, hoping that it might expand over time to serve as a tracking tool for the Australian higher education community in much the same way that it has done at the country-level elsewhere.

The Go8 participants, through their libraries, selected identical survey instruments, allowing for comparative analysis. The surveys were fielded between September 2013 and June -2014. Institution-specific reporting has been delivered to each of the participants.

In addition to our support for modest questionnaire revisions and other survey administration, Ithaka S+R was asked to conduct an analysis of the aggregate findings on behalf of the group. That analysis is presented in this report.

Methodology

The Australian version of the Survey of Academics was administered locally to five Go8 participants, including: University of Western Australia, University of New South Wales, University of Melbourne, University of Queensland, and University of Sydney. The findings of the five survey implementations were aggregated for this report.

Ithaka S+R worked with the participating Go8 institutions to develop a version of the survey instrument that was previously used in US and UK contexts. The common instrument covers topics in several key areas, including: how academics discover materials for research; academics' use of varying types of materials; digital research activities and methodologies; data preservation and management practices; student research skills; research dissemination; and the role of the library in supporting academics' needs.[1] Due to the survey flow and skip patterns, not all Australian academics received every question in the survey.

Recruitment methods and response rates varied for each Go8 participant's implementation.[2] Each Go8 participant was provided with an institution-specific branded instance of the online survey. Ithaka S+R sent personalized email invitations directly from our survey platform on behalf of UWA and Sydney. Melbourne, UNSW, and UQ opted to send the email invitations internally using single open access links. In total, 4,189 respondents started the survey across the five institutions, and 2,887 of those respondents completed the survey.

In this analysis, we also report findings at the disciplinary level in addition to the aggregate for further context. A total of 306 humanists completed the survey, compared with 998 physical and natural science academics, 643 social scientists, and 901 medical or veterinary academics.[3]

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[1] With the exception that UNSW elected not to field the Data Preservation and Management module.

[2] Due to the disparity in recruitment methods, and since not all participants utilized the same sampling approach, it is not possible to estimate the overall response rate with an appropriate level of confidence or accuracy, and it is thus not possible to conduct more sophisticated statistical analyses in terms of generalizations to the larger population of Australian academics at Go8 institutions, as these approaches rely on a higher level of certainty and consistency in sampling methods in order to estimate population parameters and apply models that are estimated according to built-in assumptions.

[3] The Go8 participants' questionnaire includes a demographic item asking respondents to self-report their academic discipline from a list of 22 disciplines. In this report, we group the disciplines into four categories by mapping the 22 options onto the groupings that were used in the 2012 UK Survey of Academics, because the 2012 US Faculty Survey did not include medical or veterinary academics. Arts and Humanities includes the following disciplines: Studies in creative arts and writing; Language, communication, and culture; History and archaeology; and, Philosophy and religious studies. Social sciences includes the following disciplines: Build environment and design; Commerce, management, tourism and services; Economics; Education; Law and legal studies; Psychology and cognitive sciences; and, Studies in human society. Natural and Physical Sciences includes the following disciplines: Mathematical sciences; Physical sciences; Chemical sciences; Earth sciences; Environmental sciences; Biological Sciences; Information and computing science; Engineering; and, Technology. Medical and veterinary includes the following disciplines: Medical and health sciences; and, Agricultural and veterinary sciences.

Table 1

Participant	Number of Complete Responses	Incentive	Number of Reminders Sent	Duration	Response Rate
UWA	568	Chance to win 1 of 2 iPads	2	30/9/13 – 14/10/13	31%
Sydney	815	Chance to win an iPad	2	3/2/14 – 21/2/14	27%
Melbourne	260	One $1000 prize offered to second sample in 2014	2	31/10/13 – 22/12/13 and 9/5/14 – 17/6/14	Approx. 14 - 16%*
UQ	934	One iPad mini and one $250 voucher	1	24/3/14 – 21/4/14	Approx. 6%*
UNSW	311	None	2	1/12/13 – 24/1/14	11%
Total	**2,887**				

*At Melbourne, a technical issue necessitated a second implementation. Invitations were sent to two different randomly selected samples of n = 800 for each implementation, and the response rate also includes a number of respondents who accessed the survey via an open link, thus the response rate is an approximate estimate. At Queensland, the staff contact list may include a number of former staff members, and thus the response rate is an approximate estimate.

Responses are generally grouped together into categories for questions where respondents are asked to respond on a 1 to 10 scale. We report on responses in three categories: 1-3 (strong negative response), 4-7 (moderate or indifferent response), and 8-10 (strong positive response). Questions that use a 1-6 scale, and their responses are similarly grouped into categories: 1-2 (strong negative response), 3-4 (moderate or indifferent response), and 5-6 (strong positive response).

In addition to analysis of the G08 participant findings, comparisons are drawn against the responses from academics at R1 institutions on Ithaka S+R U.S. Faculty Survey 2012 and responses from RLUK academics on the Ithaka S+R |Jisc | RLUK UK Survey of Academics 2012.[4] Though these surveys were administered to academics at research universities as well as teaching colleges, the comparisons here focus solely on responses from research universities in the US and the UK, as these institutions are the most similar to the G08 in terms of size, structure, governance, and mission, amongst other factors.

[4] Ross Housewright, Roger C. Schonfeld, and Kate Wulfson, Ithaka S+R U.S. Faculty Survey 2012, (New York: Ithaka S+R, 2013), available at http://www.sr.ithaka.org/research-publications/us-faculty-survey-2012.
Housewright, R., Wulfson, K., and Schonfeld, R.C. (2013). 'Ithaka S+R | Jisc | RLUK: UK Survey of Academics 2012.' http://www.sr.ithaka.org/sites/default/files/reports/UK_Survey_of_Academics_2012.pdf. Details on the methodology as well as findings from each of these survey projects may be found in their respective reports. Datasets are available through ICPSR.

Key Findings

This survey takes a deliberately high-level approach, reporting on evidence-based strategically relevant insights. The results from the survey revealed the following high-level findings:

» When asked about the value of the library's various functions, the largest share of respondents—by a substantial margin—identify its role as a purchaser of resources as very important, with little variation across disciplines. In general, larger shares of respondents rate the library's collections-oriented roles as very important compared with the share of respondents who rank the library's service-oriented roles as very important. There are, however, substantial variations across disciplines here, with a larger share of humanists valuing all of the library's functions, and particularly its research and student support functions.

» Though less than one-fifth of academics surveyed indicate that they think that their students have strong research, critical analysis and information literacy skills, there exists little consensus regarding whose primary responsibility it should be to develop these skills. Amongst the academics surveyed, about one half say they think the responsibility to develop their undergraduate students' research skills should be primarily their own, while a similar share of respondents say the onus should fall on their undergraduates. Though nearly half of the respondents highly value the library's undergraduate student support role, very few of them think it should principally be the library's responsibility to develop students' information literacy skills.

» Though discovery methods differ across disciplines, very few academics start their searches for scholarly literature in the stacks at a library building. Instead, academics favour their library's website, scholarly databases or publicly available search engines such as Google Scholar. While humanists and social scientists tend to prefer to start with their library website or catalogue when searching for known items, academics from the natural and physical sciences and medical sciences do not indicate a strong preference for their library catalogue or specific scholarly databases. When 'keeping up' with scholarship in their field, respondents prefer traditional methods, including interactions with a variety of other scholars (both their immediate peers and important figures in their field) and key published materials (journals, and in the case of humanists, books and book reviews).

» Respondents report that they value established scholarly dissemination methods, prioritizing audiences in their sub-discipline and discipline, and those of lay professionals, more so than undergraduates or the general public. In addition, academics select journals in which to publish based on characteristics such as topical coverage, readership, and impact factor.

» Respondents tend to value existing publisher services, such as peer review, branding, and copy-editing, while expressing less widespread agreement about the value of

newer dissemination support services offered by libraries that are intended to maximise access and impact. Though fewer than half of respondents indicate that they make their work available through digital channels such as a website or repository, more respondents from the Go8 report utilizing these methods than do academics in the US and UK. Roughly one third of Australian respondents indicate that they think that that circulating pre-print versions of their work is a valuable form of scholarly communication.

» Academics from the social sciences, medical sciences and natural and physical sciences have begun to embrace digital research methods while humanists feel that new practices might not be relevant or valuable to the types of research that they conduct. Respondents indicate that they most often rely on digital research methods to analyse quantitative datasets that they generate in the course of their research or that other academics have compiled. Many respondents report an interest in incorporating digital research methods more deeply into their work, and say that lack of time and insufficient technical skills are the two most considerable constraints on their doing so.

» Regarding data curation, academics tend to work with research datasets or collections of media on their own computers, and think they could best be supported through access to commercial software or institutional repositories. In general, academics do not indicate that they have difficulty managing their own data, though small shares report that that they lack the financial support or technical skills to do so effectively.

» Though slight and notable variations are discussed in this report, in general, responses from the Go8 participants are similar to those from Ithaka S+R's U.S. Faculty Survey 2012 and UK Survey of Academics 2012. This suggests that geographical location—though likely a considerable factor in determining the proximity of conferences, funding options available, and the ease of travel to physical collections—does not substantially affect the ways in which academics value their libraries, discover new materials, disseminate their research, etc.

The Role of the Library

The Go8 Survey of Academics was designed to explore the changing ways that academics publish, share, and use different types of materials in the course of their research and teaching. To establish a baseline for analysing the various aspects of the life cycle of academic materials, the survey explores one of the primary enterprises involved in academics' use of these resources for both research and teaching: the university library. Though explicitly explored in this section, the role of the library in supporting academics appears as an organising theme throughout this report regarding questions on topics that range from research to teaching to data management. The survey explores how academics understand the role of the library, especially at a time when technological innovation is changing the ways in which they conduct research and gain access to needed information.[5] As questions are raised about the value of the traditional library and the changing requirements of librarians' skill sets, the Go8 survey aims to better understand how academics value the library's various functions within their institutions.[6]

One of the longest-running areas of interest in Ithaka S+R's surveys of academics has been how the role of the academic library has evolved over time. These surveys ask respondents to rate 'how important is it to you that your university library provides each of the functions below or serves in the capacity listed below' for a list of roles. While by no means a comprehensive list of potential library functions within an institution, these roles broadly encompass many of the ways in which academics interact with the library and understand its role in relation to the university. The below list outlines the functions included in the Go8 survey, each identified by a shorthand used throughout this document.[7] While the first six categories below are identical to those used in Ithaka S+R's US Faculty Survey 2012 and UK Survey of Academics 2012, the final two categories (postgraduate and higher degree student support) were added as new categories for the Go8 survey:

- Gateway: 'The library serves as a starting point or 'gateway' for locating information for my research'.

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[5] Association of College and Research Libraries (ACRL), Value of academic libraries: a Comprehensive Research Review and Report: (Chicago: Association of College and Research Libraries, 2010) available at http://www

[6] Gaby Haddow, 'Knowledge, Skills and Attributes for Academic Reference Librarians', Australian Academic and Research Libraries, July 8, 2013, http://www.tandfonline.com/doi/pdf/10.1080/00048623.2012.10722279.

[7] This shorthand was not used in the survey instrument administered to respondents

- Buyer: 'The library pays for resources I need, from academic journals to books to electronic databases'.

- Archive: 'The library serves as repository of resources-in other words, it archives, preserves, and keeps track of resources'.

- Teaching support: 'The library supports and facilitates my teaching activities'.

- Research support: 'The library provides active support that helps to increase the productivity of my research and scholarship'.

- Undergraduate support: 'The library helps undergraduates develop research, critical analysis, and information literacy skills'.

- Postgraduate student support: 'The library helps postgraduate coursework students develop research, critical analysis, and information literacy skills'.

- Higher degree student support: 'The library helps higher degree students develop research, critical analysis, and information literacy skills'.

The first three roles—gateway, buyer, and archive—capture what Ithaka S+R categorizes as 'collections-driven metrics'. These metrics measure the perceived importance of the library's collections and their role in facilitating access to materials for teaching and research. The last five roles track what we call 'engagement metrics', and gauge how academics perceive the value of the library's research and instructional services. The last three of these five service-oriented roles each refer specifically to student support roles, but are broken down according to the students' levels of study.

Without question, respondents identify the library's role as a 'buyer' as its most important function, with more than 90% of academics surveyed ranking the statement 'the library pays for resources I need, from academic journals to books to electronic databases' as very important. Roughly two out of three respondents identify the library's 'gateway' and 'archive' roles as very important. In general, these responses follow the same patterns as those from Ithaka S+R's US Faculty Survey 2012 and the UK Survey of Academics 2012, and all three indicate that academics perceive the library's function as a purchaser as its most valuable role by a substantial margin. However, when compared to responses from the US and UK, an even larger portion of respondents from the surveyed Australian institutions rank the library's buyer role as very important.

Respondents rank three of the library's service-oriented roles as less important than any of its collections-related functions. When asked to rank how important it was that 'the
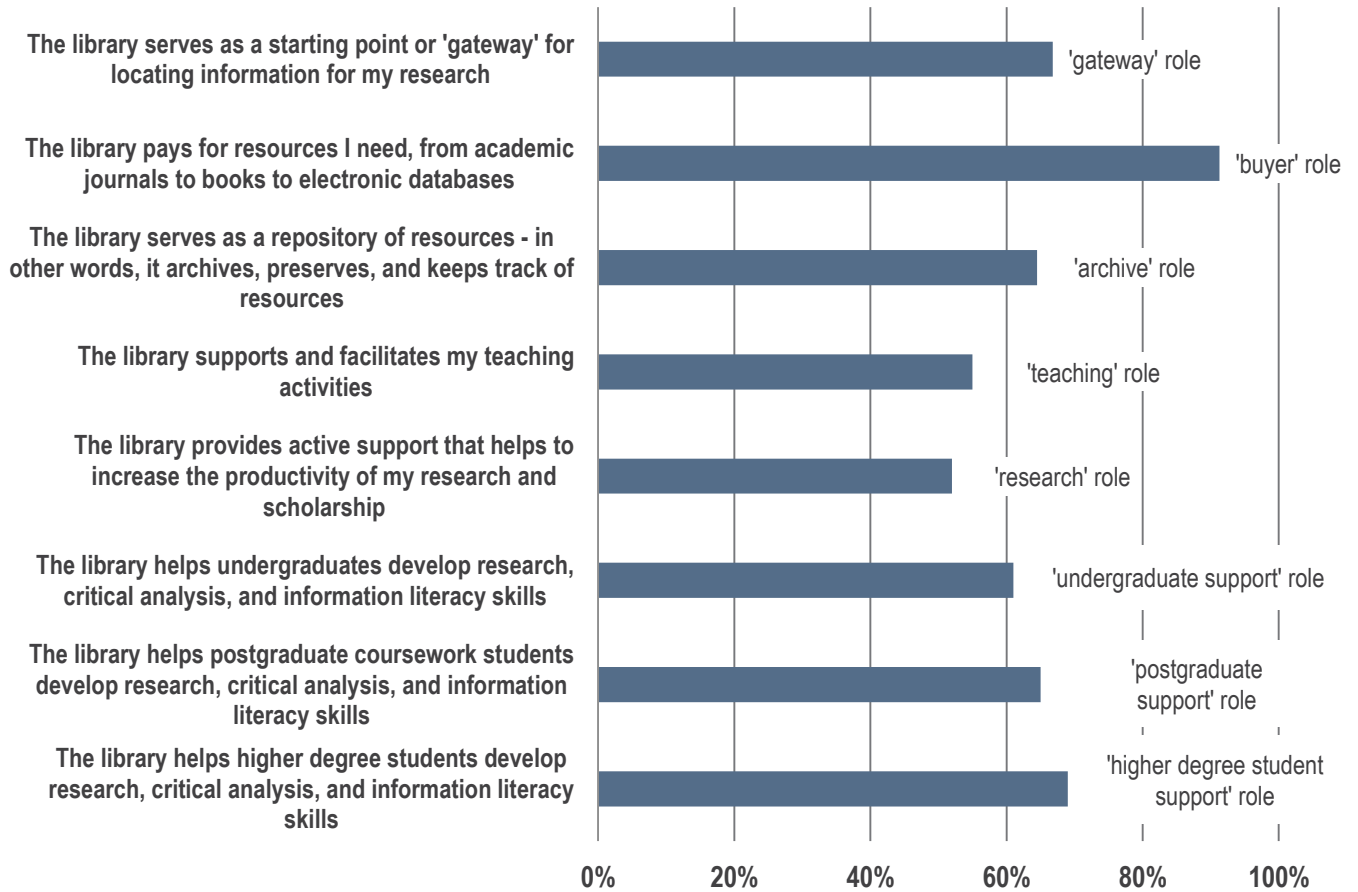
library supports and facilitates my teaching activities', more than half of respondents (55%) ranked this 'teaching support' role as very important. A slightly smaller share of respondents (52%) value the library's provision of 'active support that helps to increase the productivity of my research and scholarship' as very important. While these results yield similar patterns and rankings as do responses on the US and UK survey, larger shares of Australian respondents rank most of the library's roles as very important. This held particularly true for the library's collections-oriented functions.[8]

For the final three roles, academics were asked to assess the perceived value of the library's services in helping students to 'develop research, critical analysis, and information literacy skills'. Ithaka S+R's US and UK surveys of academics only ask participants to rank how valuable it is that the library helps undergraduates develop these skills. In the Go8 instrument, respondents also rank the library's value for postgraduate (professional degree) and higher degree (research degree) students. While academics usually rank the library's student support roles as slightly less important than its roles as a gateway or archive, the inclusion of questions about graduate students reveals that—at least at the Australian institutions surveyed—respondents do perceive the library's student support function as equally valuable to some of its collections-oriented roles for these specific groups of students. Because higher degree students are often pursuing careers in research, it makes sense that a relatively large share of respondents perceive the library as very important for this type of student. The higher degree student support role ranked second amongst all of the library's functions, though a substantially smaller share of respondents rate it as very important compared with those respondents who identify the library's buyer role as very important.

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[8] Because the US Faculty Survey 2012 and UK Survey of Academics was administered to faculty members at research universities and teaching colleges, participants were asked 'How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below?' while Go8 respondents were asked 'how important is it to you that your university library provides each of the functions below or serves in the capacity listed below?' These differences in wording apply to all questions with that refer to universities and their services.
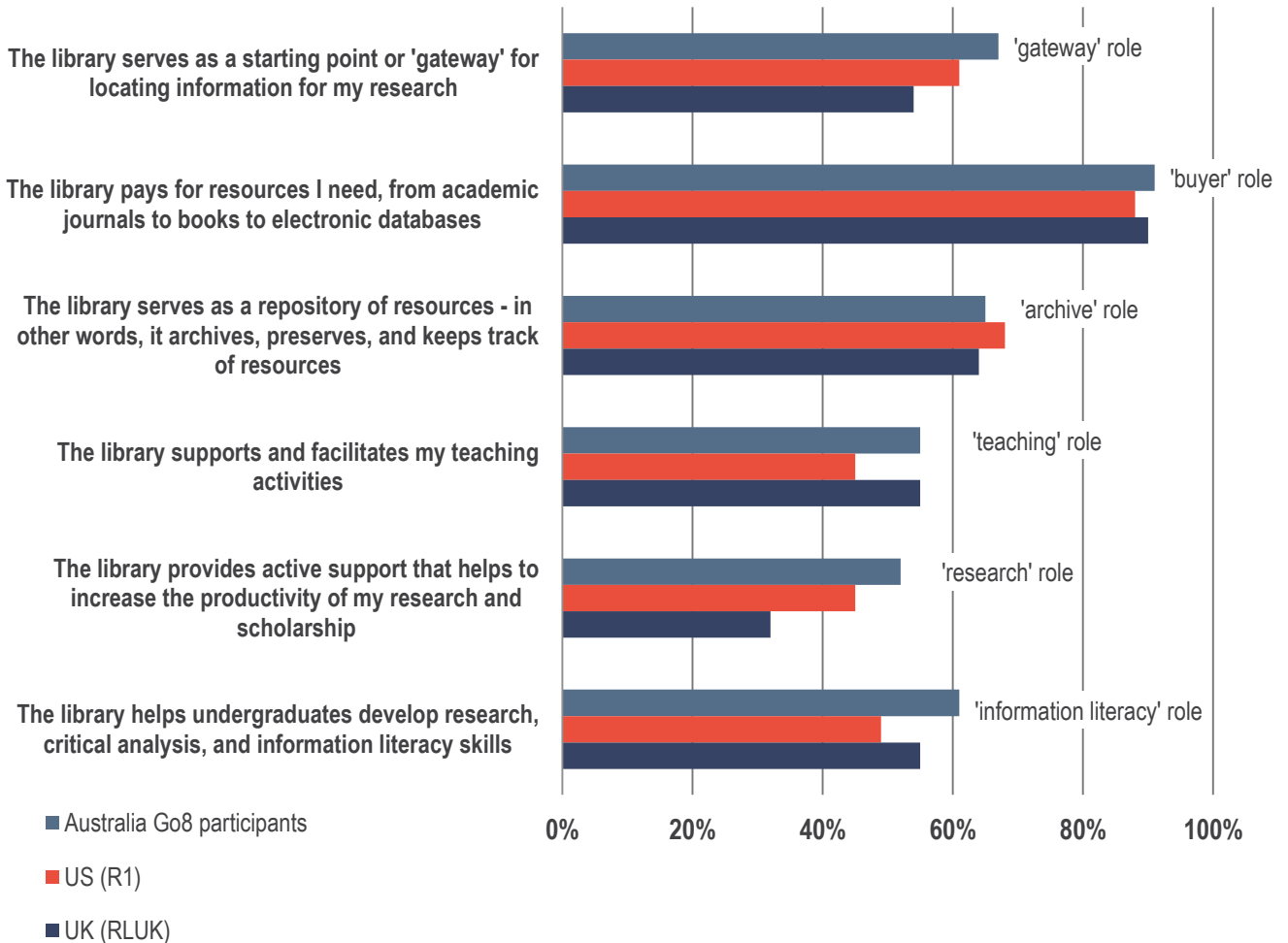
Table 2

How important is it to you that your university library provides each of the functions below or serves in the capacity listed below?*

The library serves as a starting point or 'gateway' for locating information for my research — 'gateway' role

The library pays for resources I need, from academic journals to books to electronic databases — 'buyer' role

The library serves as a repository of resources - in other words, it archives, preserves, and keeps track of resources — 'archive' role

The library supports and facilitates my teaching activities — 'teaching' role

The library provides active support that helps to increase the productivity of my research and scholarship — 'research' role

The library helps undergraduates develop research, critical analysis, and information literacy skills — 'undergraduate support' role

The library helps postgraduate coursework students develop research, critical analysis, and information literacy skills — 'postgraduate support' role

The library helps higher degree students develop research, critical analysis, and information literacy skills — 'higher degree student support' role

*Percent of respondents rating each item as 'extremely important' (5-6 on a 6 point scale).

Table 3
How important is it to you that your university library provides each of the functions below
or serves in the capacity listed below?*

The library serves as a starting point or 'gateway' for locating information for my research — 'gateway' role

The library pays for resources I need, from academic journals to books to electronic databases — 'buyer' role

The library serves as a repository of resources - in other words, it archives, preserves, and keeps track of resources — 'archive' role

The library supports and facilitates my teaching activities — 'teaching' role

The library provides active support that helps to increase the productivity of my research and scholarship — 'research' role

The library helps undergraduates develop research, critical analysis, and information literacy skills — 'information literacy' role

■ Australia Go8 participants
■ US (R1)
■ UK (RLUK)

0%   20%   40%   60%   80%   100%

*Percent of respondents rating each item as 'extremely important' (5-6 on a 6-point scale), by country.

Just as an international comparison reveals that the largest share of academics value the library as a purchaser of materials, so too does a cross-disciplinary examination show definitively that academics across departments think the library's most important role is that of the buyer. However, looking at responses at a disciplinary level does make clear some distinct patterns at work in terms of how different sorts of teachers and researchers view the role of the library. On the whole, a larger share of humanists rank the library's importance relatively highly in each category---a finding that is masked in the aggregate data because of the relatively small number of respondents from these disciplines. While two-thirds of respondents overall rate the library's gateway and archive roles as very important, eight out of ten humanists identify the gateway function as very important,
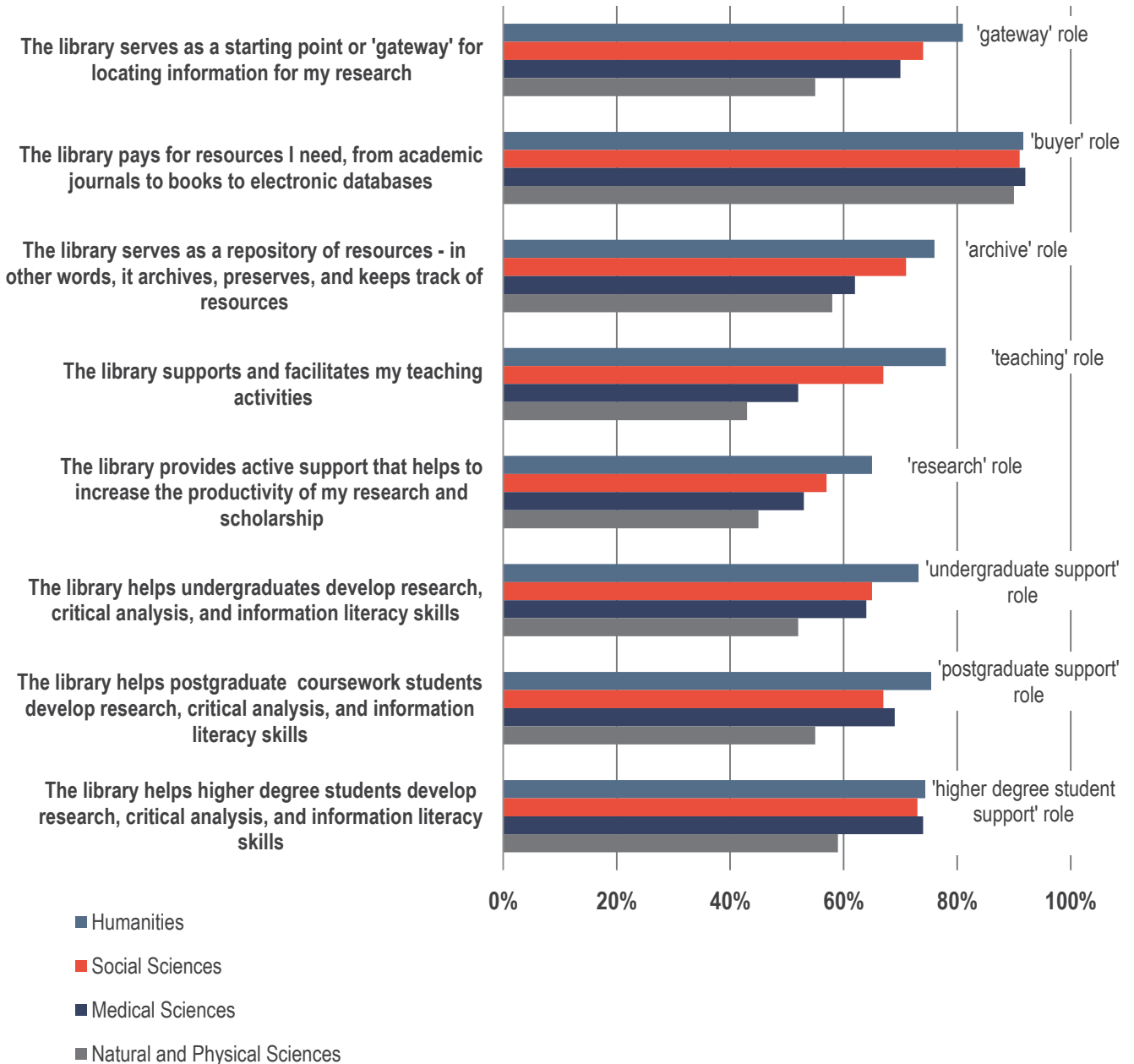
and three out of four humanists value the library's archiving role in this way. The contrasts between how humanists and academics from other fields perceive the value of the library's service-oriented activities are more pronounced. More than three out of four humanists indicate that it is very important that 'the library supports and facilitates my teaching activities' (as compared to 55% overall), and three out of four of humanists rank all three of the library's student support roles (for undergraduates, postgraduates, and higher degree students) as very important.

While a larger share of humanists than academics from other fields rank the library's collections and services as very important, natural and physical scientists tend to place less value on each of the library's functions, with the exception of its buyer role (which was valued relatively consistently across disciplines). In particular, a smaller share of natural and physical scientists value the library's service-oriented roles highly, with fewer than half identifying its teaching and research support functions as very important. While these patterns are similar to those in the results of the US Faculty Survey 2012 (where a larger share of humanists and a smaller share of scientists rank most of the library's roles as very important), overall, amongst both humanists *and* scientists, a larger share of Australian academics rank the library's service-oriented roles as very important.

Comparing responses across institutions reveals less notable differences than does examining results across disciplines, and most institutional differences might be explained by each university's disciplinary makeup. Not surprisingly, the largest share of respondents from each university surveyed rate the library's buyer role as very important, while identifying its teaching and research support roles as the least vital. In each category, a smaller portion of respondents from UWA rank the library's role as very important. The most notable of these is represented in responses to the library's gateway function, which 56% of respondents rank as very important (while results at Queensland, Melbourne and Sydney were each closer to 70%). However, academics from University of Sydney rank the importance of the library's roles as higher than aggregated results in each category. Sydney stands out in particular in the extent to which academics from this institution value the library's teaching support function (63% as compared to just a little more than 50% at all other universities). The disciplinary breakdown of respondents from UWA and Sydney may account for some of these patterns. The former institution had a relatively larger portion of natural and physical scientists respond to the survey (who tend to rank the library's roles as less important) compared with the level of response amongst humanists (who tend to place more value on library collections and services).

Table 4

How important is it to you that your college or university library provides each of the functions below or serves in the capacity listed below?*
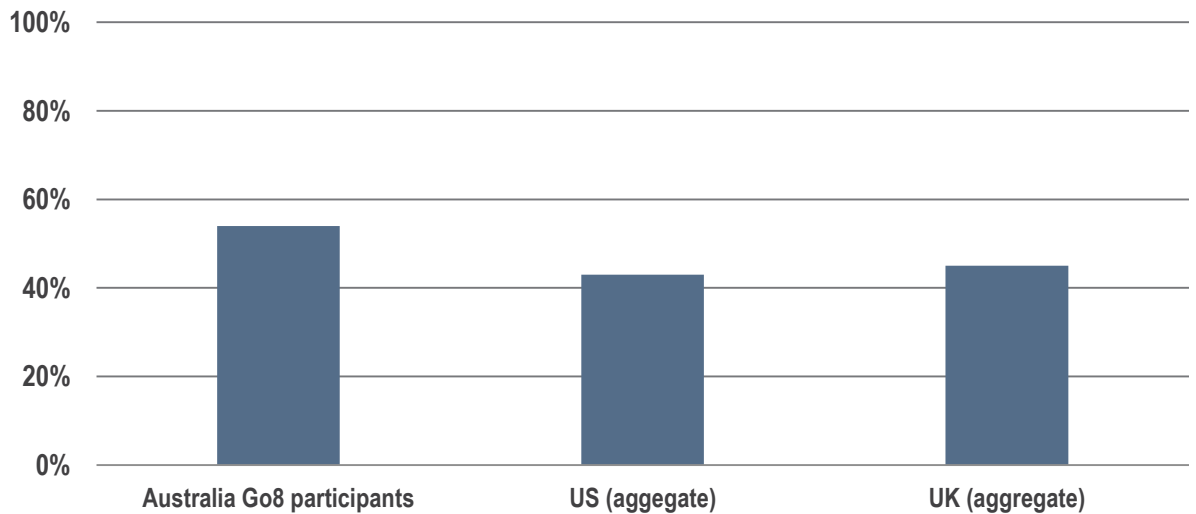

*Percent of respondents rating each item as 'extremely important' (5-6 on a 6-point scale), by disciplinary grouping.

While these responses provide a sense of how academics value the library's varied roles within an institution, the survey also asked questions to gauge how reliant respondents were, in practice, on the library for their own research (an activity that encompasses all

but the library's teaching and student support roles). When asked 'how dependent are you on your university library for the _research_ you conduct' a majority of Australian respondents report that they are very dependent. This number represents a slightly larger share of respondents than on Ithaka S+R's US and UK surveys of academics, and remains consistent with the international variations apparent in questions regarding the value of the library's roles. Because a larger share of Australian academics are dependent on the library for their research, it makes sense that larger shares also rank most of the library's functions as very important.

Table 5
How dependent would you say you are on your university library for research you conduct?*

*Percent of respondents indicating that they were very dependent on their university library (8-10 on a 10-point scale), by country.

Notably, two-thirds of humanist respondents say they are very dependent on the library for research, while only about half of the respondents from the social sciences, medical sciences and natural and physical sciences characterize themselves in this way. This finding makes sense given the varied research practices between disciplines.

Table 6
How dependent would you say you are on your college or university library for
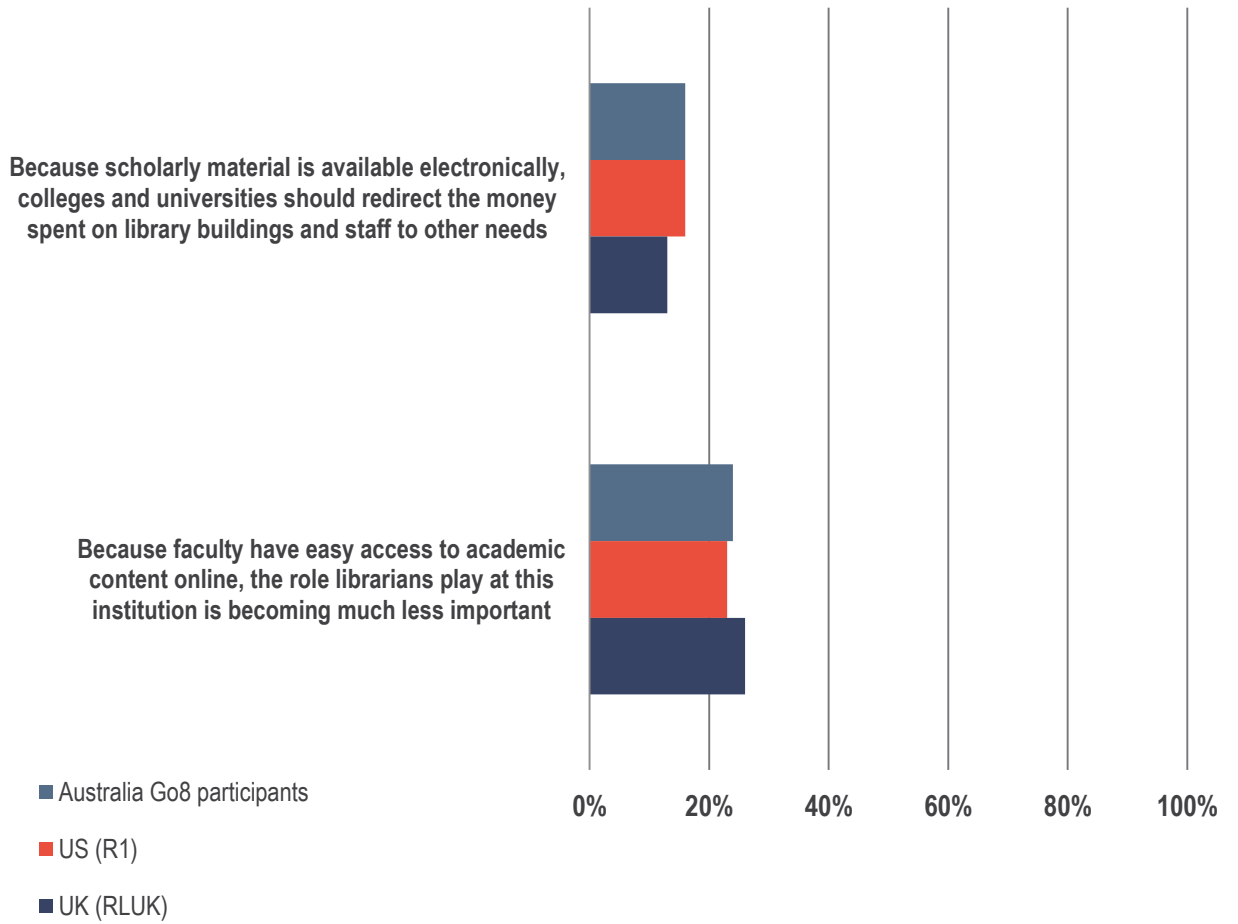research you conduct?*

*Percent of respondents indicating that they were very dependent on their university library (8-10 on a 10-point scale), by disciplinary grouping.

Additionally, participants were asked two questions designed to evaluate how they perceive the changing value of the library. About 16% of academics agree with the statement 'because scholarly material is available electronically, universities should redirect the money spent on library buildings and staff to other needs'. While these rates are comparable to responses on the US Faculty Survey 2012, a slightly larger share (almost 25%) of Australian respondents agree with the statement 'because faculty have easy access to content online, the role librarians play at this institution is becoming much less important'. In all three countries, a larger share of academics agree with the statement about the declining importance of the librarian's role than they did with the assertion about redirecting funds away from library facilities.

Consistent with their responses to questions regarding the value of library roles, more humanists disagree with both statements about the declining value of the library and its staff, while more natural and physical scientists agree. Responses from academics in the social sciences and medical sciences follow similar patterns as the aggregate data, and a noticeably smaller share of respondents from these disciplines agree with these statements than do respondents from the natural and physical sciences.
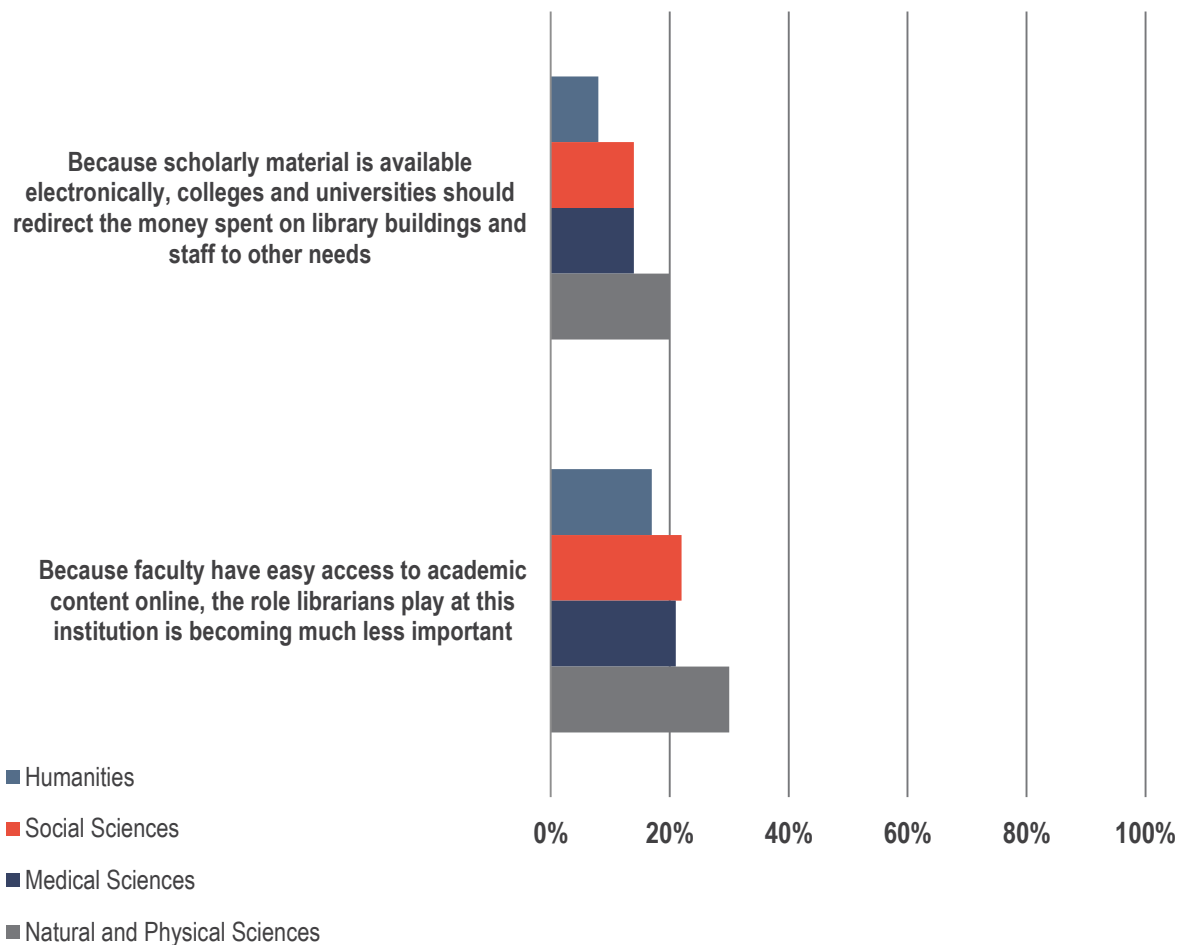
Table 7

Academics' views about the changing role of the library*

Because scholarly material is available electronically, colleges and universities should redirect the money spent on library buildings and staff to other needs

Because faculty have easy access to academic content online, the role librarians play at this institution is becoming much less important

■ Australia Go8 participants

■ US (R1)

■ UK (RLUK)

*Percent of respondents agreeing strongly with each statement (8-10 on a 10-point scale), by country.

Table 8

Academics' discipline-specific views about the changing role of the library*

*Percent of respondents agreeing strongly with each statement (8-10 on a 10-point scale), by disciplinary grouping.

While responses to questions regarding the library's roles and academics' dependence on the library for research provide insight into how academics value the library's collections and services, neither offer a clear view as to what academics understand to be the 'primary responsibility' of the library. To fill this gap, the survey had respondents rate the extent to which they agree with the two following statements: 'the primary responsibility of my university library should be facilitating my access to any scholarly materials in print or digital form that I may need for my research and teaching', and 'the primary responsibility of my university library should be supporting undergraduate student learning by helping students to develop research skills and find, access and make use of needed materials'.

Like their peers at US and UK research institutions, Australian academics tend to agree that the library's primary responsibility should be supporting their research (72%

strongly agree), rather than developing the research skills of their undergraduate students (45% strongly agree). Despite the notable variation between disciplines in assessing the importance of library's collections-oriented and service-oriented roles, academics' responses regarding the library's primary responsibility remain relatively consistent across all disciplines. These patterns suggest that--even though more humanists than natural and physical scientists think that it is very important that the library help students develop research skills—they still understand the library's principal function as oriented towards their own work, rather than towards their students'.

Table 9
Academics' opinions about the library's primary responsibility.*

*Percent of respondents agreeing strongly with each statement (8-10 on a 10-point scale), by country.

Student Research Skills

Though a majority of academics think the library's principal responsibility should involve supporting them rather than undergraduate students, libraries have always served important teaching functions. At most universities, librarians are expected to play important roles in helping students to develop their research and information literacy

skills. [9] In Australia, the Australian Government's Higher Education Participation and Partnerships Program (HEPPP) allocates money to university initiatives that encourage retention and participation, and research has been done into how libraries can contribute to this effort.[10] A number of questions were included on the survey to shed light on how academics think students and libraries do and should interact with one another, particularly in cases where this interaction is related to the library's role in equipping students with research, critical analysis, and information literacy skills.

To establish a baseline from which responses regarding the library's role in developing students' research could be meaningfully interpreted, respondents first reported on how they perceive the relative strength of their students' research and analysis competencies. When asked to rate how strongly they agree with the statement 'my undergraduate students have poor research, critical analysis, and information literacy skills,' roughly one-third of Australian respondents agree. These patterns did not differ dramatically from those from academics at R1 institutions in the US. When asked to rate the statement 'my undergraduate students have poor skills related to locating and evaluating scholarly information,' 40% of R1 respondents agree. Of course, the different wording of the US inquiry precludes a true comparison between these two questions (the latter asks about student success in specific activities, while the question on the Go8 survey queried a more abstract set of skills). Academics from RLUK institutions, on the other hand, express more faith in their undergraduates' research skills. Less than 20% of respondents agree that their undergraduate students have poor research and discovery skills.

Though no important disciplinary differences are apparent with regards to perceptions of student research skills, across all disciplines, less than 20% of academics strongly *disagree* with the assertion that their undergraduates had 'poor research, critical analysis and information literacy skills'. Additionally, seven out of ten respondents indicate that they expect their undergraduates 'to locate and use secondary academic sources—journals, scholarly monographs—in their coursework and student research projects beyond the readings' assigned for class'. Roughly half of the academics surveyed have similar expectations regarding their students' use of primary sources.[11] A larger
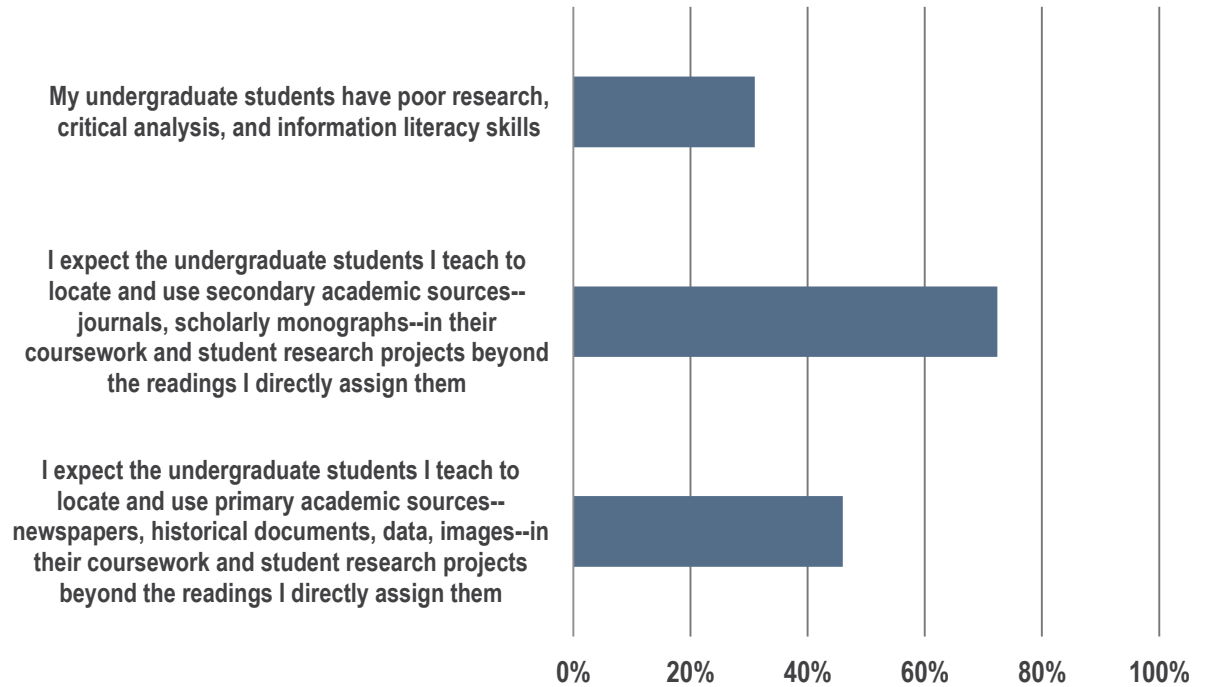
[9] See Alan Bundy, 'Beyond Information: the academic library as educational change agent', 7th International Bielefeld Conference, Germany, 2004, http://ura.unisa.edu.au/R/?func=dbin-jump-full&object_id=unisa28325.

[10] Pauline Hagel, Anne Horn, Sue Owen and Michael Currie, "How can we help?' The Contribution of University Libraries to Student Retention', Australian Academic and Research Libraries, July 8, 2013, http://www.tandfonline.com/doi/pdf/10.1080/00048623.2012.10722278.

[11] In the Go8 instrument, we also asked faculty about their expectations regarding postgraduate students' use of primary and secondary sources. Not surprisingly, more faculty had high expectations for postgraduate students than they did for undergraduates, with 85% of respondents expecting their postgraduate students to locate and use secondary sources and 63% expecting them to locate and use primary sources.
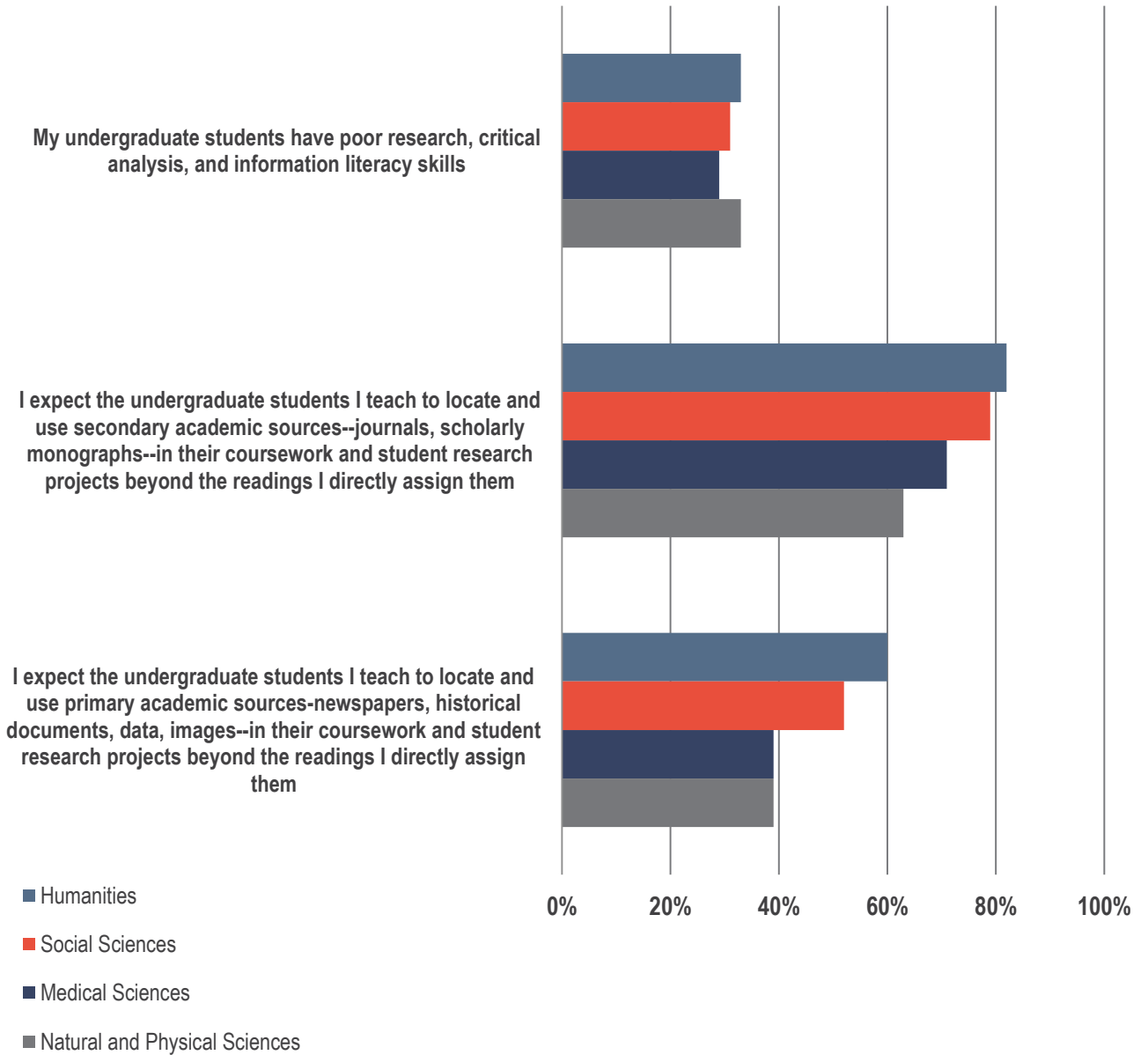
share of respondents from the humanities and social scientists strongly agree with both statements, though a slightly smaller share of social scientists concur.

Table 10
Academics' opinions about undergraduates' research skills.*

*Percent of respondents agreeing strongly with each statement (8-10 on a 10-point scale).

Table 11
Academics' opinions about undergraduates' research skills.*

Legend:
- Humanities
- Social Sciences
- Medical Sciences
- Natural and Physical Sciences

Categories (top to bottom):
- My undergraduate students have poor research, critical analysis, and information literacy skills
- I expect the undergraduate students I teach to locate and use secondary academic sources--journals, scholarly monographs--in their coursework and student research projects beyond the readings I directly assign them
- I expect the undergraduate students I teach to locate and use primary academic sources-newspapers, historical documents, data, images--in their coursework and student research projects beyond the readings I directly assign them

*Percent of respondents agreeing strongly with each statement (8-10 on a 10-point scale), by disciplinary grouping.

Additionally, when asked to rank the accuracy of the statement 'improving my undergraduate students' research, critical analysis, and information literacy skills is an important educational goal for the courses I teach', a substantial share of survey respondents--nearly eight out of ten—indicate that this sentence describes their point of view very well. It is important to note that this statement does not identify an individual
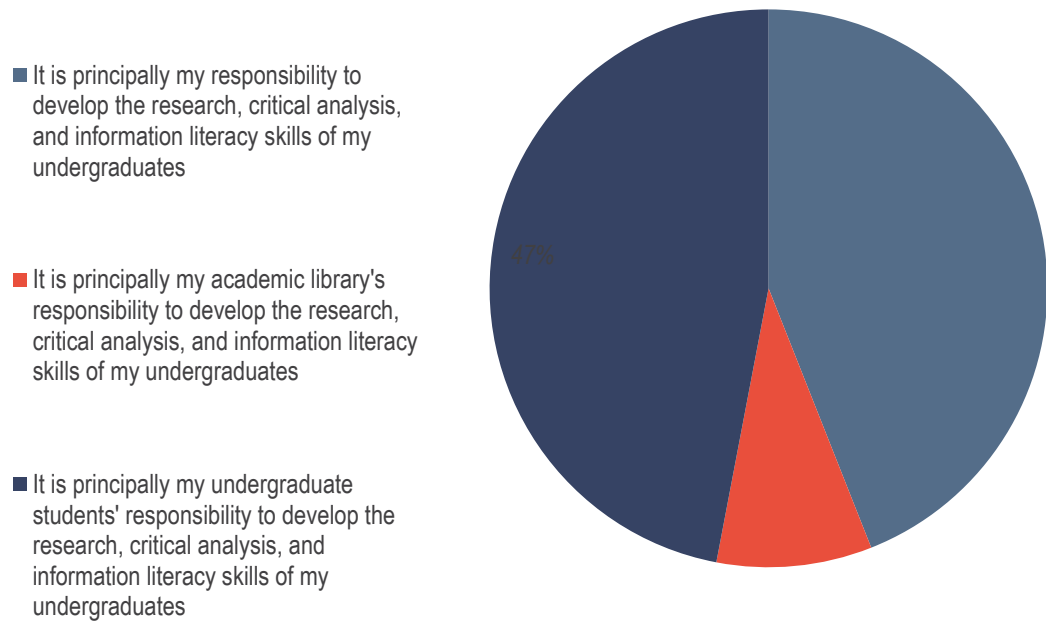
or campus unit responsible for the development of these skills, but merely a course as the context in which these skills should be developed. With few respondents indicating substantial confidence in their undergraduates' research skills, yet a larger share maintaining high expectations for their students' research activities and identifying their courses as arenas in which students can develop these competencies—the question emerges: who do academics think is responsible for developing undergraduates' research, critical analysis, and information literacy skills?

The survey included questions meant to provide some sense of how respondents understood the answer to this question. Respondents were asked to select whether it was 'principally' their own, undergraduates', or the academic library's 'responsibility to develop the research, critical analysis, and information literacy skills' of undergraduate students. Like responses to this question on Ithaka S+R's US Faculty Survey 2012, the Go8 participants' responses indicate that—while academics believe their undergraduate students' research skills need to be developed through coursework—there exists little agreement on who should take the lead on this endeavour.[12] The share of respondents who say it is principally their responsibility (44%) and those who indicate that it is principally their undergraduates' responsibility are roughly even (47%). Less than ten percent of respondents indicate that they think it is principally the library's responsibility to nurture these competencies, with little variation across disciplines. Yet, in an earlier question about the importance of the library supporting undergraduates, two-thirds of the respondents rate this as important. This discrepancy raises questions about exactly what faculty view as support for undergraduates.[13]

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[12] See Ross Housewright, Roger C. Schonfeld and Kate Wulfson, US Faculty Survey 2012 (New York: Ithaka S+R, 2012), available at http://www.sr.ithaka.org/research-publications/us-faculty-survey-2012.

[13] When American library directors and leaders were asked the same question in Ithaka S+R's US Library Survey 2013, roughly 70% indicated that they thought it was principally the library's responsibility to develop undergraduates' research skills. See Roger C. Schonfeld and Matthew P. Long, Ithaka S+R US Library Survey 2013 (New York: Ithaka S+R, 2014), available at http://www.sr.ithaka.org/sites/default/files/reports/SR_LibraryReport_20140310_0.pdf. Though no such survey has been conducted in the Australian context, we can speculate that we would see similar discrepancies between academics' and library staff views.

Table 12
Developing undergraduates' research skills.*

- It is principally my responsibility to develop the research, critical analysis, and information literacy skills of my undergraduates

- It is principally my academic library's responsibility to develop the research, critical analysis, and information literacy skills of my undergraduates

- It is principally my undergraduate students' responsibility to develop the research, critical analysis, and information literacy skills of my undergraduates

*Percent of respondents selecting each option (respondents could only select one item).

Of course, the noteworthy discrepancies between these data points can be explained, in part, by the different types of questions. While few academics think that the library should be *principally* responsible for developing undergraduate research skills, a larger portion believe that it is very important that this role exist among the library's many functions (though fewer than half of respondents think it should be the library's primary role). Next to other questions regarding the library's contribution to student learning and skill development, a similar picture emerges: while most respondents do not believe that it is principally the responsibility of their academic library to develop undergraduate information literacy and research proficiency, a larger (though not overwhelming) portion believe that the library contributes (or should contribute) significantly to undergraduate learning.
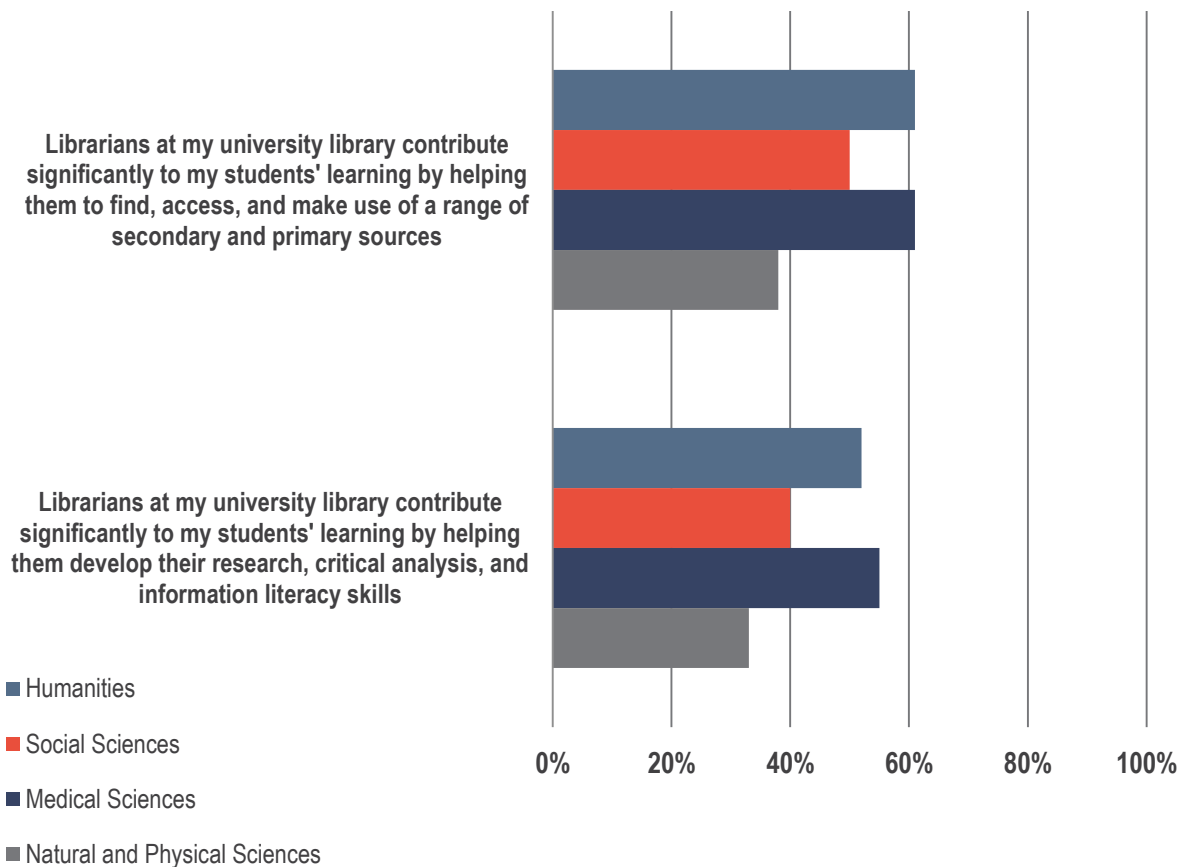
While questions regarding the library's role and responsibility provide insight into how academics think the library *should* function within an institution, participants were also queried about how university librarians actually support students' academic performance and the development of their research skills. When asked to rank how well the statement 'librarians at my university library contribute significantly to my students' learning by helping them to develop their research, critical analysis, and information

literacy skills', a little less than half of respondents indicate that this statement describes their point of view very well.[14] These metrics reveal disparities between how academics view the importance of the library's undergraduate support role (nearly two-thirds ranked it as very important), and how they understand its actual contributions to the development of undergraduate research skills.

To a similar yet distinct question about whether librarians 'contribute significantly to students' learning by helping them to find, access, and make use of a range of secondary and primary sources in their course work', about half of respondents say that this statement describes their point of view very well. While both questions about librarians' contributions present similar patterns to those from Ithaka S+R's US and UK Faculty surveys, a comparison across disciplines reveals patterns congruent with those already discussed in this report. Roughly one-third of natural and physical scientists surveyed agree strongly with these statements. Among humanists, nearly two-thirds agree strongly that librarians' contributed to student learning by helping them access sources, and more than half say that librarians contribute significantly to the development of student research skills. These patterns reflect similar demographic breakdowns to questions about the library's roles (see Table 4). They also resonate strongly with different attitudes among physical and natural scientists and humanists regarding the changing role of the librarian, the former of which, in general, tend to think that the librarian's role is declining in importance.

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[14] It is important to note that, while many of the survey's questions regarding the development of student research skills ask specifically about undergraduate students, this question (and the next two discussed) is less specific, and does not specify a certain subcategory of students. Because respondents answered a number of questions that asked about undergraduate students, it's possible many continued to consider this group when answering this question, though its lack of specificity should be considered when comparing it to other, more particular questions.

Table 13
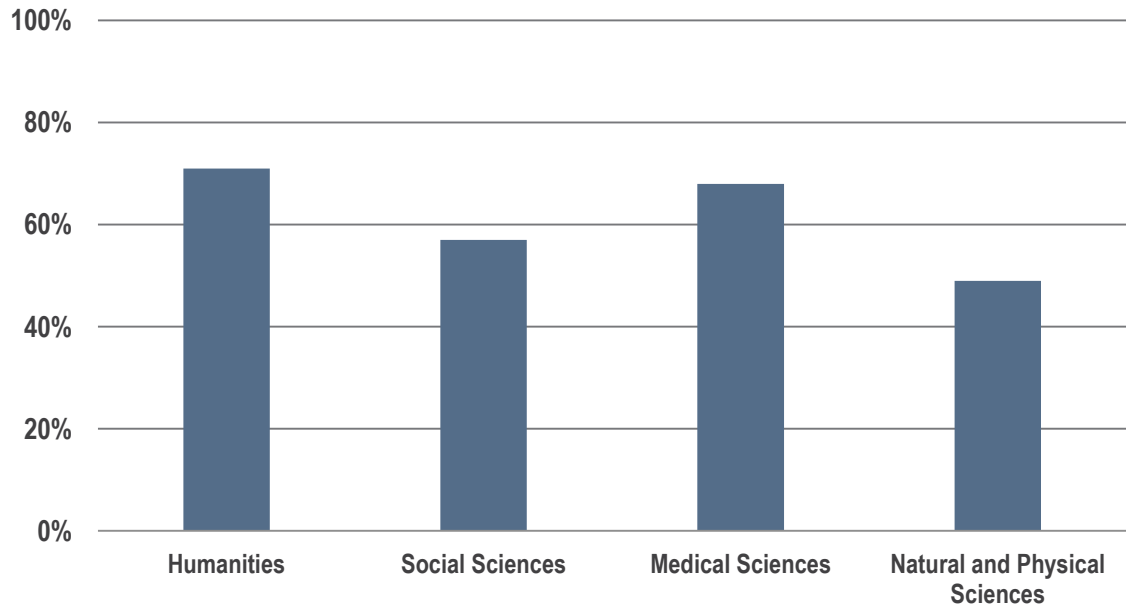Academics' opinions about the role of the librarian.*

Librarians at my university library contribute significantly to my students' learning by helping them to find, access, and make use of a range of secondary and primary sources

Librarians at my university library contribute significantly to my students' learning by helping them develop their research, critical analysis, and information literacy skills

■ Humanities
■ Social Sciences
■ Medical Sciences
■ Natural and Physical Sciences

*Percent of respondents agreeing strongly with each statement (8-10 on a 10-point scale), by disciplinary grouping.

Similar patterns emerge in responses to the question 'as far as you know, how often do students in the courses you teach interact with librarians at your university—often, occasionally, rarely or never?' Seven out of ten academics from the humanities---who place more value on the library's collections-oriented roles—say that their students interact with the library 'often' or 'occasionally', while about half of the respondents from the natural and physical sciences respond in the same way. Respondents from the medical sciences, who usually responded to questions about the library in ways that reflect results in the aggregate data, indicate a higher rate of perceived engagement amongst their students that we would have expected. Of medical science academics surveyed, 16% report that their students interact with the library often, and another 52% report that their students interact with the library occasionally.

Table 14
As far as you know, how often do students in the courses you teach interact with librarians at your university library--often, occasionally, rarely, or never?
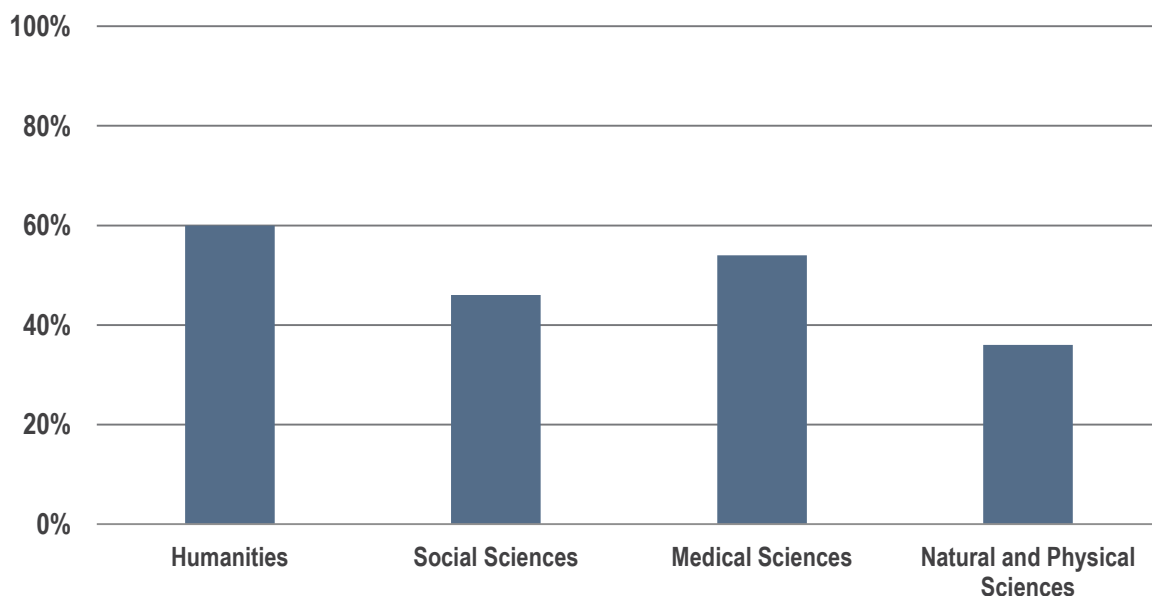

*Percent of respondents reporting that their students interacted with librarians 'often or 'occasionally', by disciplinary grouping.

Academics from the medical sciences and humanities express a greater degree of faith in the library's ability to help students succeed in their courses. When asked to rate 'the extent to which undergraduate students' interaction with librarians at your university library helps them to succeed in our courses', 60% of respondents from the humanities and 54% of academics from the medical sciences report that the library helps substantially. While the latter results do not deviate dramatically from aggregate results (47%) or reports from social scientists (46%), they appear to indicate substantial differences between the ways that academics from the medical sciences and the natural and physical sciences view the potential of the library to help students. Among physical and natural scientists, roughly one-third said that the library helped their students significantly.

Table 15
Undergraduate students' interaction with librarians at your university library helps them to succed in your courses.*

*Percent of respondents agreeing strongly with this statement (8-10 on a 10-point scale), by disciplinary grouping.

While there emerged no noteworthy differences in how academics from Australia, the US or the UK viewed the utility of the library in helping students, disciplinary breakdowns make clearer a picture that began to emerge in responses to questions about the role and value of the library: humanists view the library—and particularly its service-oriented roles-- as more valuable, available, and more highly utilized by their students than do academics from other disciplinary groupings. Additionally, these findings also highlight that the library plays a substantial role in the education of students in the medical sciences—a distinction that only becomes apparent with academics' responses to questions about students' library usage. However, because academics from the medical sciences do not indicate in substantially higher rates that the library should or does contribute to the development of 'undergraduate research, critical analysis, and information literacy skills', we can speculate that they understand the library as serving a different purpose in supporting student learning—perhaps one more related to the acquisition of content knowledge than research skills.

Some distinct patterns also emerge when the results are broken down by institution. As was the case with variations we saw in responses to questions about the library's role, some of these patterns might have more to do with disciplinary, rather than institutional,

tendencies. Notably, a smaller share of academics from UNSW indicate that they believe that librarians on their campus contribute to student learning. While half of respondents overall strongly agree that 'librarians at my university library contribute significantly to my students' learning by helping them to find, access, and make use of a range of secondary and primary sources in their course work', only one-third of faculty members from UNSW respond in this way. Similarly, 44% of all respondents agree with the statement 'librarians at my university library contribute significantly to my students' learning by helping them to develop their research, critical analysis, and information literacy skills', but only 28% of respondents from UNSW say that this describes their point of view. Comparable trends emerge when in UNSW academics' responses to questions about student interaction with the library. Among the academics surveyed at UNSW, 44% say their students interact with the library often or occasionally, as compared to 60% in the aggregate. Additionally, 31% say that these interactions are very helpful, as compared to 47% in the aggregate). A relatively larger share of respondents from the University of Melbourne, on the other hand, think the library contributes to student success and engagement.

Some of these differences begin to make sense when contextualized amongst disciplinary breakdowns and institutional trends apparent in other sections of the survey. The share of respondents from the humanities is smaller at UNSW than at any other institution, while the share of natural and physical scientist respondents is relatively high. As discussed earlier, humanists tend to understand library and librarian contributions to student learning as more significant and valuable than do scientists, so the relative dearth of humanist respondents from UNSW might provide some insight into the patterns we see here. Additionally and relatedly, when asked about the library's student-support roles, a relatively small share of respondents from UNSW indicate that they think it is very important that the library support undergraduate and postgraduate students. While these responses reflect prescriptive rather than descriptive perceptions, the consistency between them does suggest that fewer of the respondents UNSW value the library's student-support functions than do academics on other campuses.
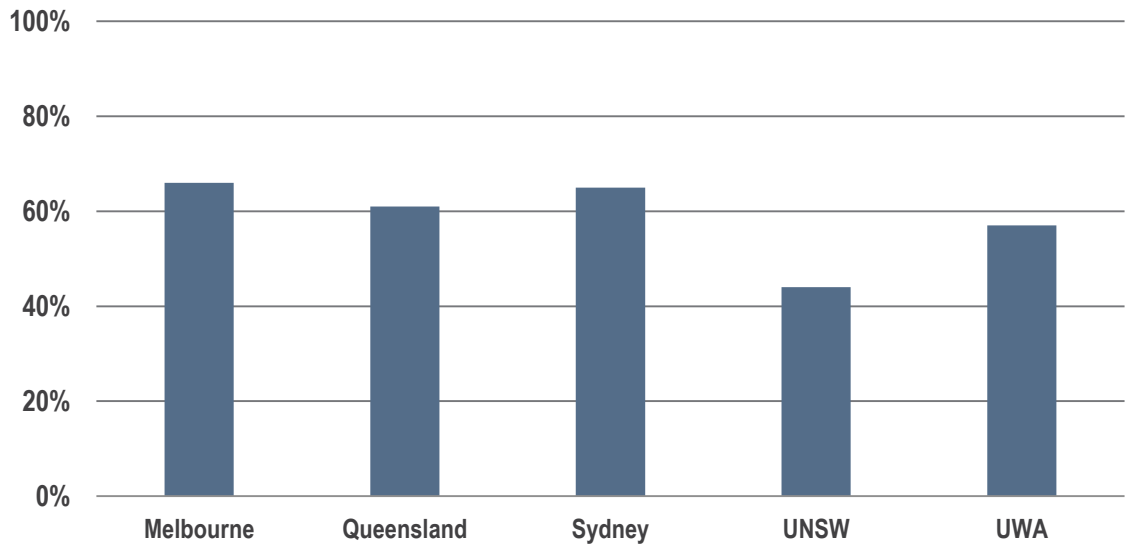
Table 16
Academics' opinions about librarians' contributions to student learning.*

Librarians at my university library contribute significantly to my students' learning by helping them to find, access, and make use of a range of secondary and primary sources

Librarians at my university library contribute significantly to my students' learning by helping them develop their research, critical analysis, and information literacy skills

- ■ Melbourne
- ■ Queensland
- ■ Sydney
- ■ UNSW
- ■ UWA

0%   20%   40%   60%   80%   100%

*Percent of respondents agreeing strongly with each statement (8-10 on a 10-point scale), by institution.

Table 17

As far as you know, how often do students in the courses you teach interact
with librarians at your university library--often, occasionally, rarely, or never?*

*Percent of respondents reporting that their students interacted with librarians 'often or 'occasionally', by institution.

Table 18
Undergraduate students' interaction with librarians at your university library
helps them to succed in your courses.*

*Percent of respondents agreeing strongly with this statement (8-10 on a 10-point scale), by institution.

Discovery, Research Practices and Research Dissemination

Discovery

While many respondents value the library's role in developing their students' research skills, most indicate that they think its role in supporting their own research is even more important. Indeed, as academics have continued to rely more on digital or digitized materials for their research, libraries have continued to offer a growing variety of tools to support scholars in navigating scholarly literature. These include changes to long-established tools like the library catalogue and infrastructure for linking to and between needed materials. Recently, many libraries have invested heavily in indexed discovery services, tools that provide single search box interfaces to explore a range of different types of library collections.[15] In addition to library-provided infrastructure, mainstream search engines such as Google and Bing, targeted academic discovery products by mainstream search providers (tools like Google Scholar), and a host of other products and services from inside and outside of the academy provide their own particular approach to supporting the discovery of scholarly resources.[16]

One of Ithaka S+R's longest-running survey questions on the U.S. Faculty survey asks respondents to select where they begin their research from a variety of 'locations' (physical and digital). The largest shares Go8 participants select 'a publicly available scholarly search engine, e.g. Google Scholar' (30% selection rate), and 'a specific electronic research resource/computer database' (28 %). Almost as many select the 'library website or catalogue' as (24%), while only 1% of the survey respondents report that they begin at the library building itself.
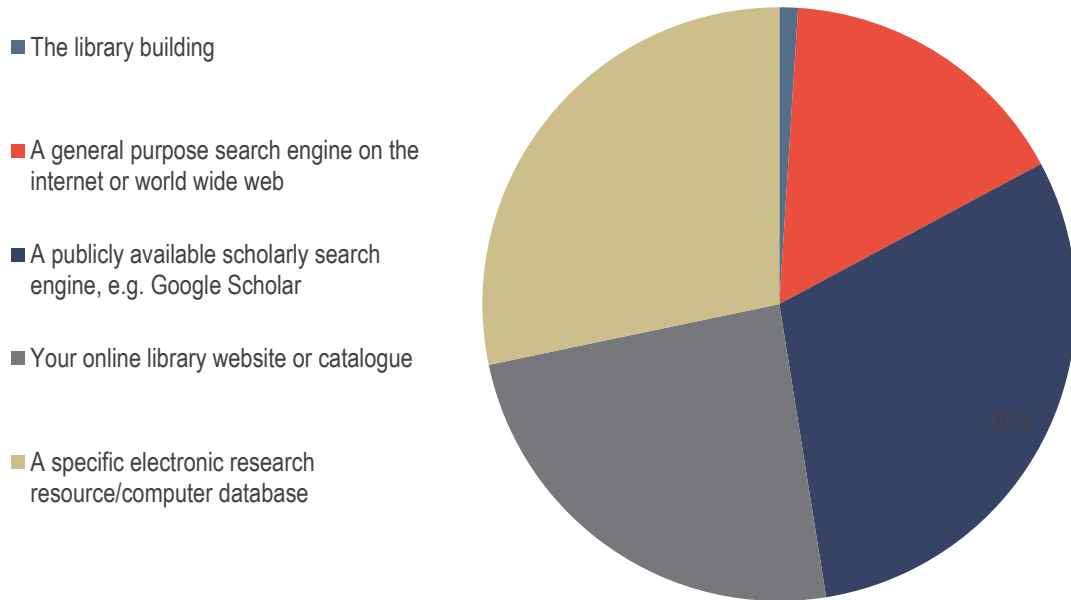
Over time, there has appeared a clear trend on the version of this question utilized in the US, as fewer respondents report beginning their research at the library building or website, and a larger share say they commence at either a scholarly or general purpose online resource. This trend was apparently halted but was not reversed in 2012. While the reformulation of this question makes a direct comparison to results from the US Faculty Survey 2012 or UK Survey of Academics 2012 impossible, it will be valuable to track trends here over time.

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[15] Judy Luther and Maureen C. Kelly, 'The Next Generation of Discovery', Library Journal, March 1, 2011, http://lj.libraryjournal.com/2011/02/industry-news/the-next-generation-of-discovery/; Rose Holley, 'Trove: More than a Treasure? How finding information just became easier', National Library of Australia Staff Papers, September 1, 2010, https://www.nla.gov.au/content/trove-more-than-a-treasure-how-finding-information-just-became-easier.
[16] Andrew D. Asher, Lynda M. Duke and Suzanne Wilson, 'Paths of Discovery: Comparing the Search effectiveness of EBSCO Discovery Service, Summon, Google Scholar, and Conventional Library Resources' College and Research Libraries, July 2013, http://crl.acrl.org/content/early/2012/05/07/crl-374.full.pdf+html.

Table 19

Typically, when you are conducting academic research, which of these starting points do you use to begin locating information for your research?*
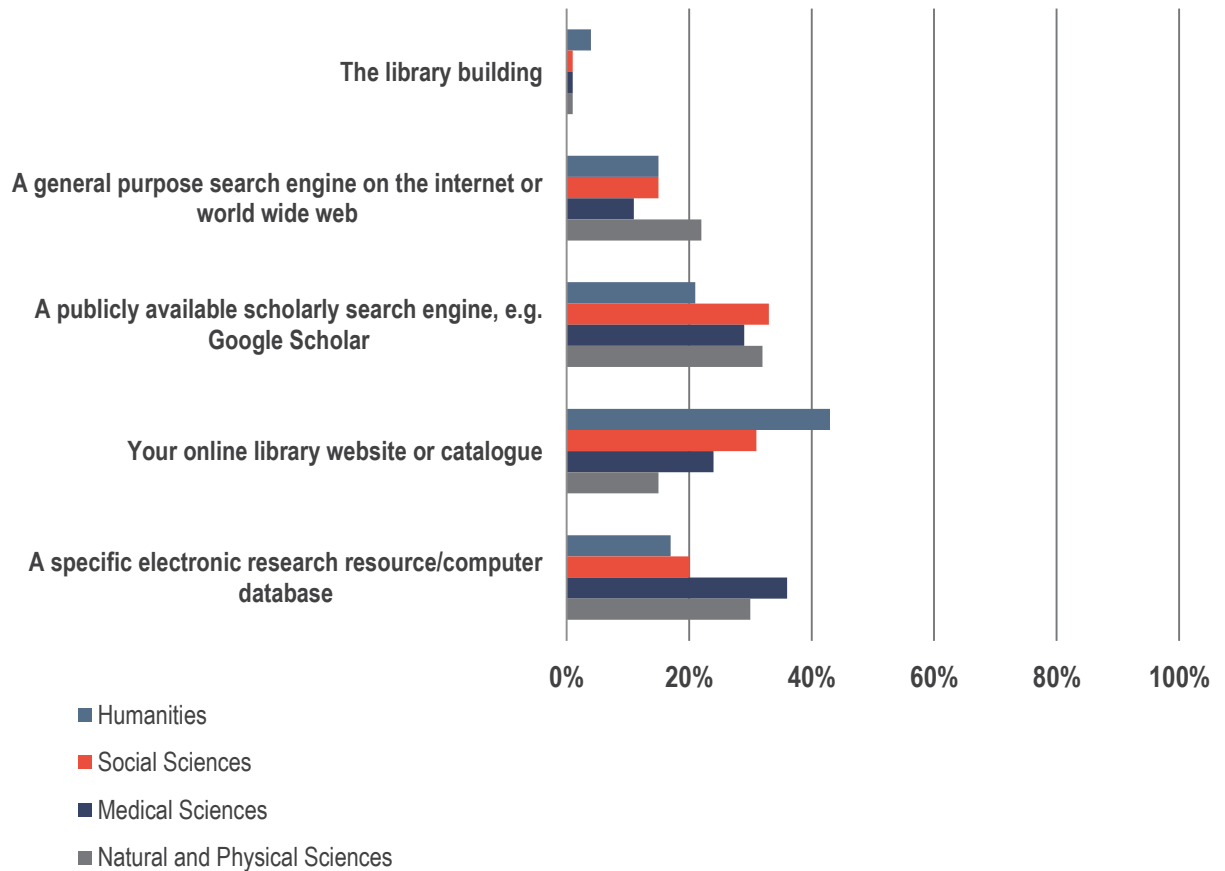
- ■ The library building

- ■ A general purpose search engine on the internet or world wide web

- ■ A publicly available scholarly search engine, e.g. Google Scholar

- ■ Your online library website or catalogue

- ■ A specific electronic research resource/computer database

*Percent of respondents selecting each option (respondents could only choose one option).

Patterns that pointed to the decreasing utilization of the library building or website as a starting point for research were more pronounced in the natural and physical sciences than in the humanities. Nearly one-half of humanists report beginning their research with the library website or catalogue, a portion that becomes particularly noteworthy when compared with the 15% of natural and physical scientists who report the library's digital incarnation as their starting point. However, less than half as many humanists as medical sciences academics report starting at a 'specific electronic research resource/computer database'. These discrepancies make more sense when considered alongside information about the different sorts of materials academics from various disciplines use.

Table 20
Typically, when you are conducting academic research, which of these starting points do you use to begin locating information for your research?*
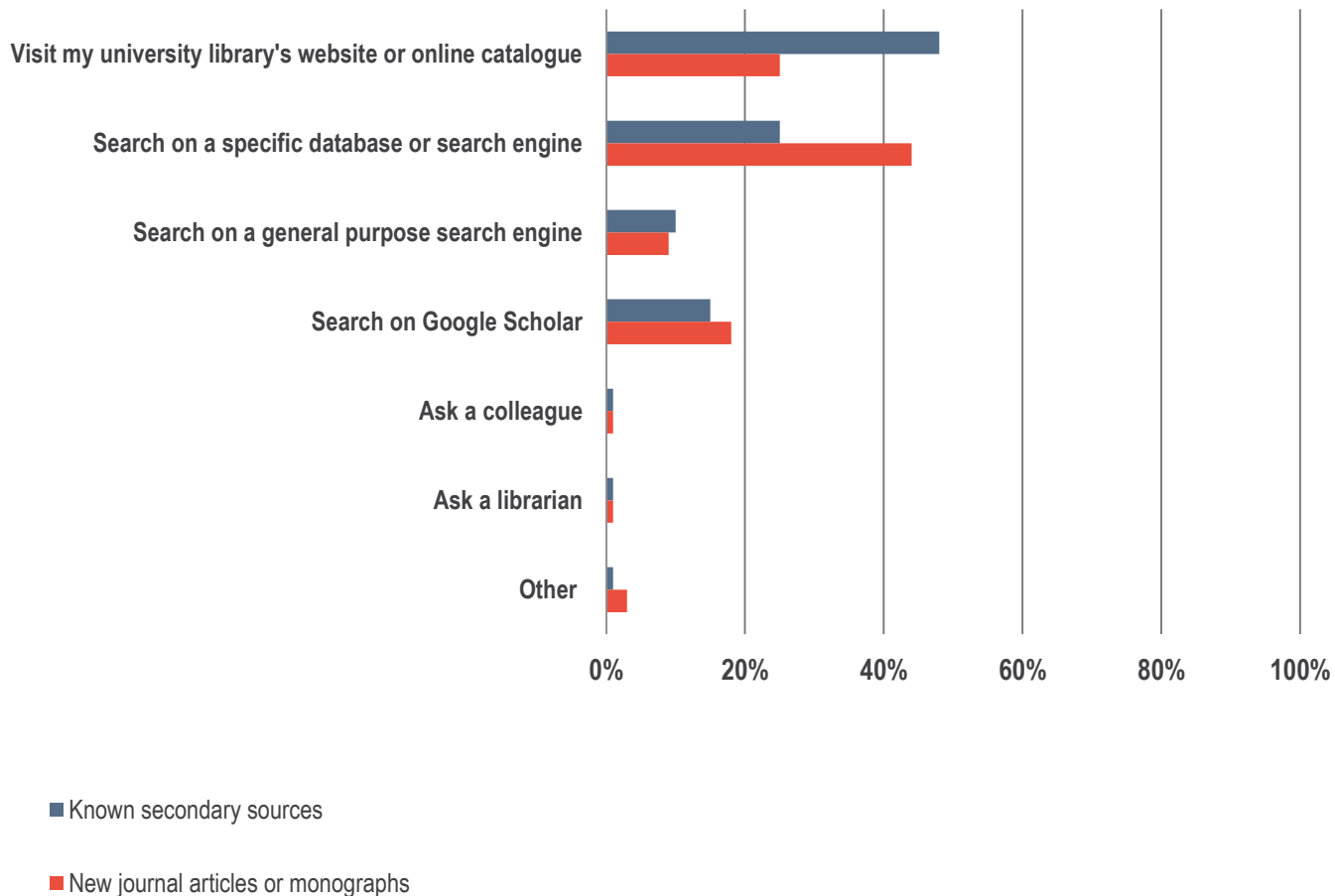

*Percent of respondents selecting each option, by disciplinary grouping (respondents could only choose one option).

To provide more insight into how academics use resources in different sorts of discovery scenarios, the survey included two, more specific questions. First, respondents were asked 'when you try to locate a specific piece of secondary academic literature that you already know about but do not have in hand, how do you most often begin your process?' In addition, they selected from a list of options to respond to the question: 'When you explore academic literature to find new journal articles and monographs relevant to your research interests, how do you most often begin your process?' For known item searches, nearly half of the academics surveyed say that they start by visiting their university library's website or online catalogue, a substantially larger portion than the 26% percent who chose these options when discussing a more generalized scenario.

When exploring academic literature to find new journals and monographs, nearly half of respondents report that they search on specific scholarly databases or search engines (44%), while only one in four say they begin by visiting the library's website or online catalogue. Though, a slightly smaller share of Australian respondents say that they start with a search on a specific scholarly database or search engine than respondents on Ithaka S+R's US Faculty Survey 2012 (52%) and UK Survey of Academics (58%), in general, response patterns to questions regarding discovery scenarios were notably consistent across countries. Academics from all three countries were very unlikely to ask a librarian or colleague for assistance in either scenario.

Table 21

Known item and academic literature searches.*

- Known secondary sources
- New journal articles or monographs

*Percent of respondents selecting each option, by discovery scenario (respondents could only choose one option).

Disciplinary differences in responses to these questions are similar to those apparent in responses to the question regarding more generalized discovery scenarios. More than

seven out of ten humanists say they started their searches for known literature on their library website or catalogue. Amongst both humanists and social scientists, a slightly larger share report that they explore new journal articles and monographs with their library website or catalogue than d those who say they use a scholarly database or search engine. While humanists and social scientists indicate a clearly preferred approach for locating known items (through their library's website or catalogue), academics from the medical sciences and natural and physical sciences appear more ambivalent. Roughly one-third of scientists say they visit their library website or catalogue for known searches (36%), while nearly as many identify scholarly databases as their starting point (32%). These tendencies might reveal differences in how academics from different disciplines are taught to use the library and discovery services.

Table 22
When you try to locate a specific piece of secondary literature that you already know about but do not have in hand, how do you most often begin your process?*

*Percent of respondents selecting 'visit my university's website or online catalogue' and 'search on a specific scholarly database', by disciplinary grouping.
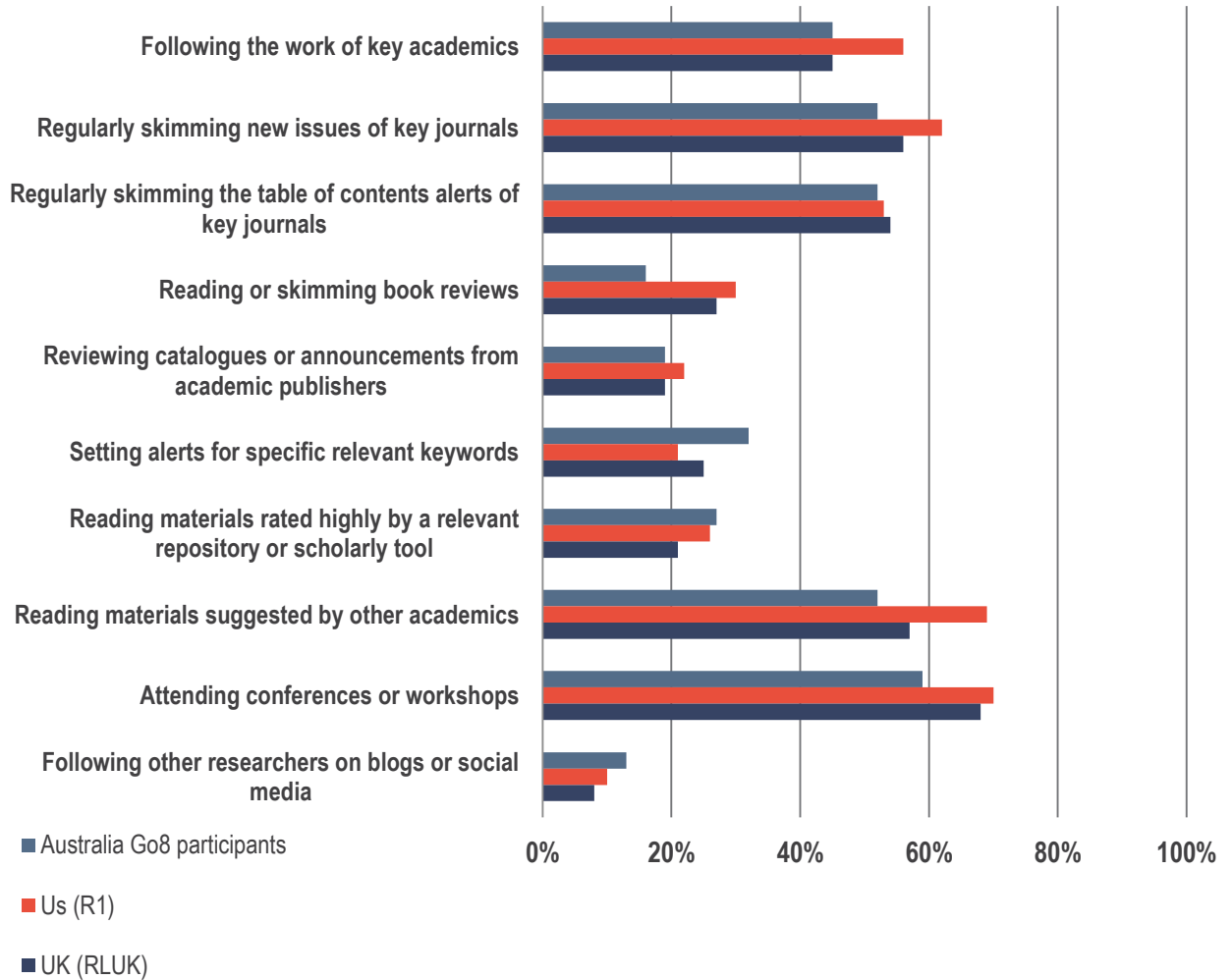
Table 23
When you explore academic literature to find new journal articles and monographs relevant to your research interests, how do you most often begin this process?*

- ■ Humanities
- ■ Social Sciences
- ■ Medical Sciences
- ■ Natural and Physical Sciences

*Percent of respondents selecting 'visit my university's website or online catalogue' and 'search on a specific scholarly database', by disciplinary grouping.

Academics keep up with scholarship in their fields in a variety of ways that go well beyond the process of searching for scholarly literature. To evaluate how academics remain abreast of major publications and trends within their areas of interest, the survey included questions that asked respondents to rate the importance of a variety of different tactics to 'keep up' with current scholarship. Here, respondents favour traditional methods. They reported that the most important tactics they employ include interactions with a variety of scholars (both their immediate peers and important figures in their field) and key published materials (journals, and in the case of humanists, books and book reviews). All of the responses that a majority of respondents rate as important involve either engaging with peers—attending conferences, reading materials recommended by colleagues, following the work of key academics—or tracking key journals by either skimming new issues or receiving alerts about their tables of contents.

When compared to response patterns from the US Faculty Survey 2012 and the UK Survey of Academics 2012, Australian academics exhibit many more similarities to UK respondents than they do to those from the US. This holds especially true when it comes to the importance that respondents place on peer-related engagements such as attending conferences and reading materials suggested by other academics. A larger share of respondents from the US rate these activities as very important. Disparities like these might mark differences in the academic cultures, funding opportunities, or the popularity of virtual networks amongst the countries surveyed.

A substantially smaller share of Australian respondents rank 'reading or skimming book reviews' as very important, though this imbalance might be explained by the differences in levels of response rates amongst humanists in Australia---who are more likely to rank this tactic highly—than did the groups from the US and UK. Similarly, the relatively large portion of Australian respondents who rank 'setting alerts for specific relevant keywords' could be attributed to the higher proportion of respondents from the medical sciences and natural and physical sciences within the Australian group. As a disciplinary analysis reveals, academics from these disciplines tend to rank this tactic as very important with greater frequency than humanists.
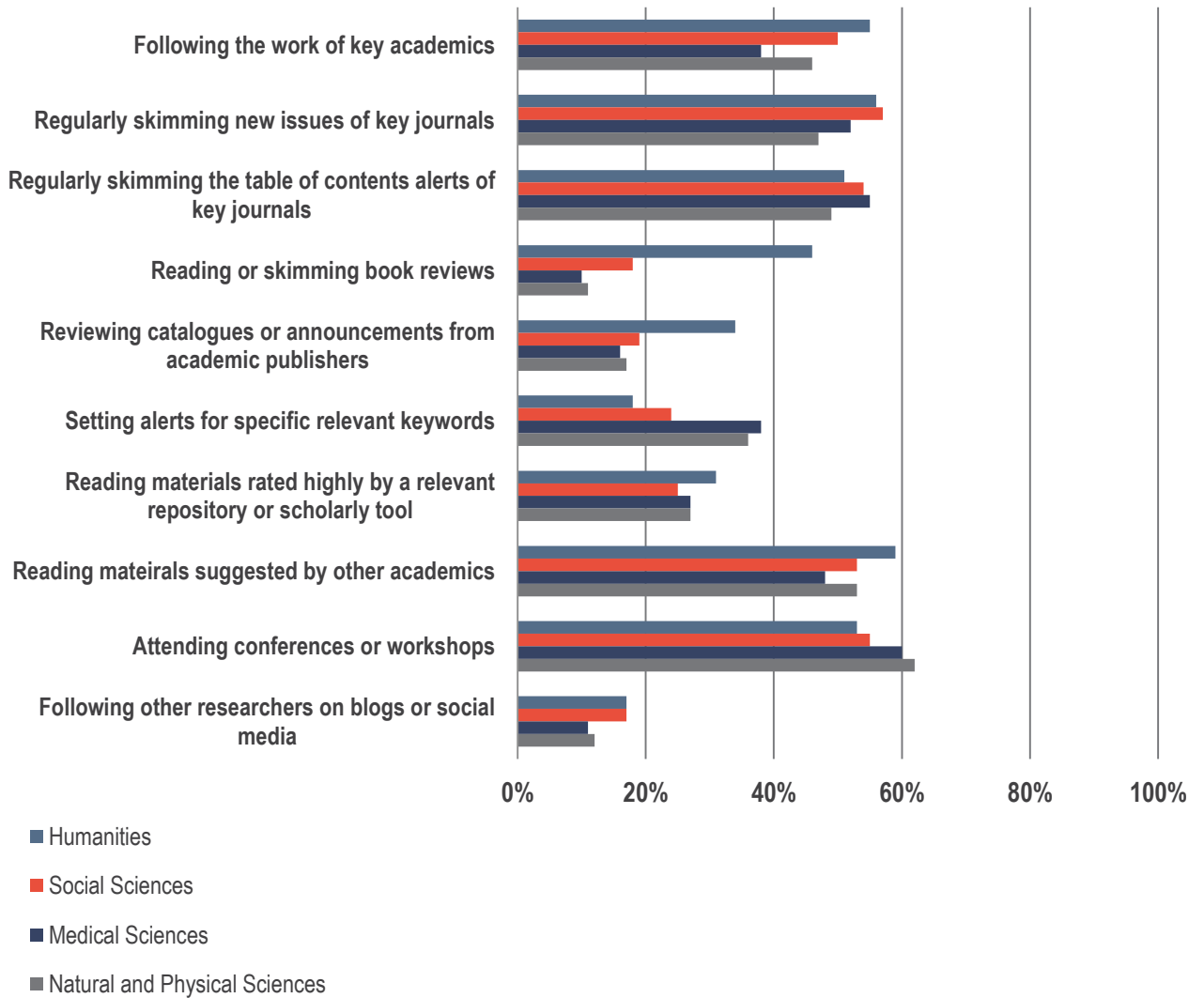
Table 24

You may employ a variety of different tactics to 'keep up' with current scholarship in your field on a regular basis. Please rate how important each of the following methods is for staying current with new scholarship in your field.*

■ Australia Go8 participants

■ Us (R1)

■ UK (RLUK)

*Percent ranking each tactic as 'extremely important' (8-10 on a 10-point scale), by country.

Table 25

You may employ a variety of different tactics to 'keep up' with current scholarship in your field on a regular basis. Please rate how important each of the following methods is for staying current with new scholarship in your field.*

Legend:
- Humanities
- Social Sciences
- Medical Sciences
- Natural and Physical Sciences

*Percent ranking each tactic as 'extremely important' (8-10 on a 10-point scale), by disciplinary grouping.

Materials Used for Research and Teaching

Primary Sources

Ithaka S+R's surveys of academics explore how the changing digital environment effects the sorts of materials academics use and the formats in which they access sources for research and teaching. One of the major transformations brought on by digital innovations has been in the increased availability of archival and primary sources in digital formats. Though archiving materials digitally brings with it a whole set of unique challenges and questions, there is no question that the availability of digital materials has made conducting research and teaching with these resources more convenient and accessible to more academics.[17]

To provide insight into how often academics use digital primary source collections rather than physical ones, the survey included preliminary questions that first asked respondents to simply indicate whether they 'use primary source materials, such as archival materials, historical newspapers, manuscripts, or images' in their teaching or research. Fewer than half of respondents indicate that they did use these materials, with roughly nine out of ten humanists, one half of social scientists, and one third of academics from the medical sciences and natural and physical sciences reporting that they rely on primary sources.
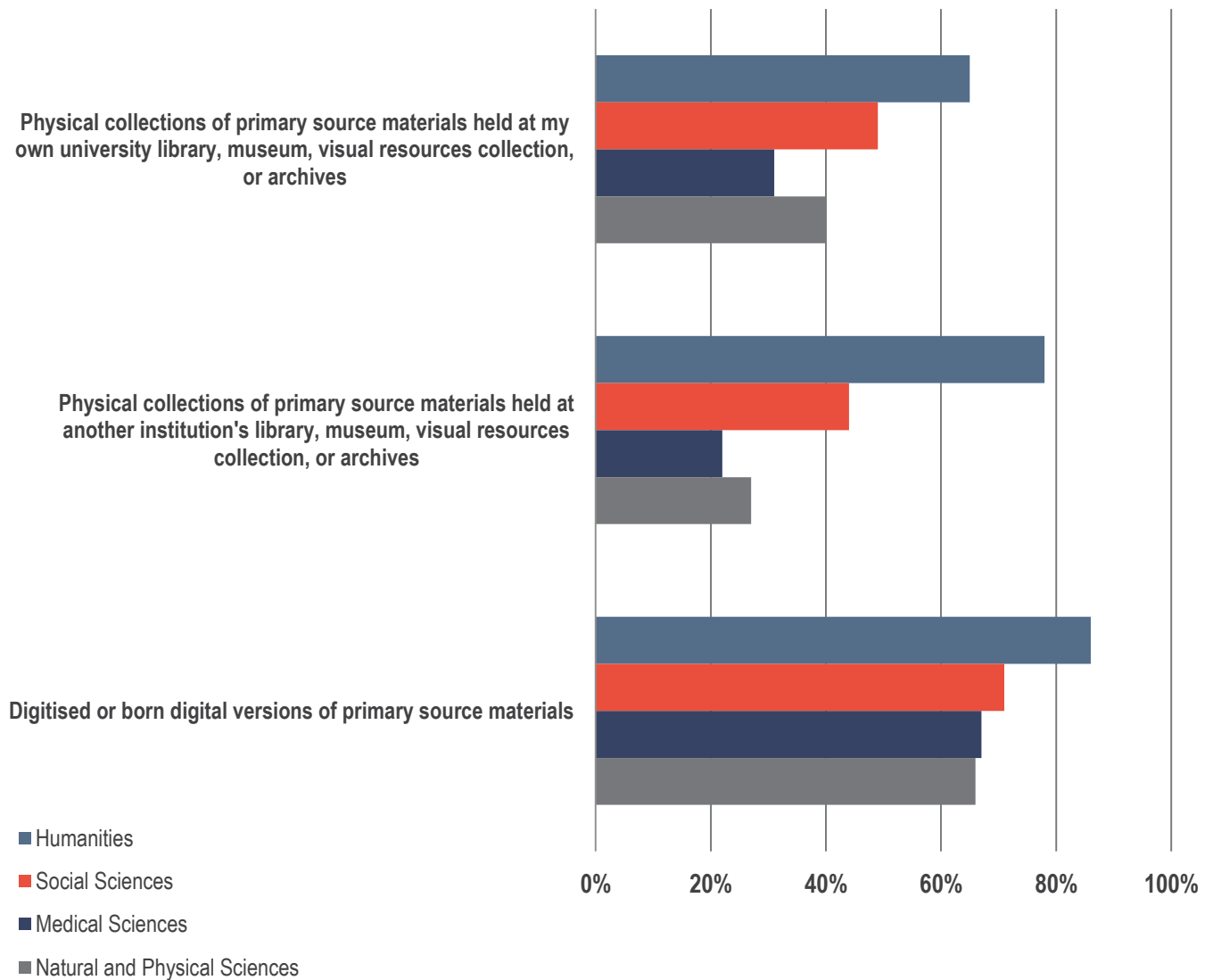
Once this subset of respondents was identified, they were asked to indicate, specifically, what sort of primary source collections they find most useful for their research activities. A substantial share of respondents—nearly seven out of ten—value 'digitised or born digital versions of primary source materials' as very important, with little variation across institutions. Four out of ten respondents say collections at their own institutions and collections housed elsewhere are very important, and the share of respondents that rank both as very important were similar to those that did so on the US Faculty Survey 2012 and the UK Survey of Academics 2012.

These numbers do mask some important disciplinary differences. While only one-third of academics from the medical sciences or natural and physical sciences rank collections at their institution as very important, nearly eight out of ten humanists say they value these resources. Though much larger shares of humanists indicate that they rely on physical collections than did academics from other disciplines, still, the largest share of humanists—86%--say that digital collections are very important for their research.

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[17] See Australia Council for the Arts, Archives in the Digital Era: scoping study report, (Surry Hills: Australia Council for the Arts, July 2011),
http://www.australiacouncil.gov.au/__data/assets/pdf_file/0017/130274/Digital_Archives_Scoping_Report-v1.pdf

Table 26

How important _to your research_ is each of the following types of primary source collections?*

- Humanities
- Social Sciences
- Medical Sciences
- Natural and Physical Sciences

(Categories shown in chart: Physical collections of primary source materials held at my own university library, museum, visual resources collection, or archives; Physical collections of primary source materials held at another institution's library, museum, visual resources collection, or archives; Digitised or born digital versions of primary source materials)

*Percent ranking each source as 'extremely important' (8-10 on a 10-point scale), by disciplinary grouping.

In response to a similar question about which types of primary source collections they value most for teaching, seven out of ten respondents say that digital collections are very important, and four out of ten indicate that they value physical collections at their own institution. A substantially smaller share—only one-in-four respondents—say that physical collections at other institutions are very important. The relative discrepancy between the share of respondents that value these sorts of collections for research and those that value them for teaching makes sense given the logistical and financial challenges of having students visit remote collections.

Secondary Sources

Academics also have many choices when deciding what sorts of secondary literature to use, and draw from a number of different publication types, formats, and media for their work. Just as Australian respondents rate traditional tactics for 'keeping up' with current scholarship more highly than they do emerging ones, so too did they indicate a preference for traditional material types over newer categories of resources when it came to conducting research. When asked to rate the importance of a variety of materials to their research, virtually all respondents (97%) report that peer-reviewed journals and journal articles are very important.[18] More than half of respondents rank scholarly monographs—in print or electronic formats—as very important, with a slightly larger share of humanists indicating that they value these materials.

In recent years, there has been significant community discussion about how technology allows academics to share research findings directly with their peers in a variety of ways. Researchers in many fields have a long history of sharing pre-print versions of articles in order to communicate research findings more rapidly, with pre-print versions serving as a complement to the eventual published version. Repositories such as arXiv, which initially focused on high energy physics and now encompasses a variety of related scientific fields, or the Social Science Research Network, have become important venues for sharing these materials on a large scale, in addition to versions provided by individual academics in an institutional repository or on a personal home page. On the Go8 survey 62% of respondents indicate that these materials—pre-print versions of materials that will be released in a peer-reviewed journal—are very important to their research. A slightly larger share of Australian respondents than US or UK respondents indicate that these materials are very important to their research, though this disparity can likely be explained, in part, by disciplinary breakdowns. A much larger share of academics from the medical sciences and natural and physical sciences identified pre-print versions of materials as very important, and these researchers made up a larger portion of respondents in the Australia sample compared with the other two national

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[18] This finding is firmly established in literature regarding research practices. See Diane Harley, Sophia Krzys Acord, Sarah Earl-Novell, Shannon Lawrence, and C. Judson King, Assessing the Future Landscape of Scholarly Communication: An Exploration of Faculty Values and Needs in Seven Disciplines (UC Berkeley: Center for Studies in Higher Education, 2010), http://escholarship.org/uc/item/15x7385g ; Tony Becher and Paul Trowler, Academic Tribes and Territories: Intellectual Enquiry and the Cultures of Discipline (Open University Press: November, 2011).

samples. However, we might speculate that these numbers also reflect a more robust culture of open access amongst the Australian institutions surveyed, particularly because academics at each university surveyed are currently able to contribute pre-print articles to open access repositories at their institution.
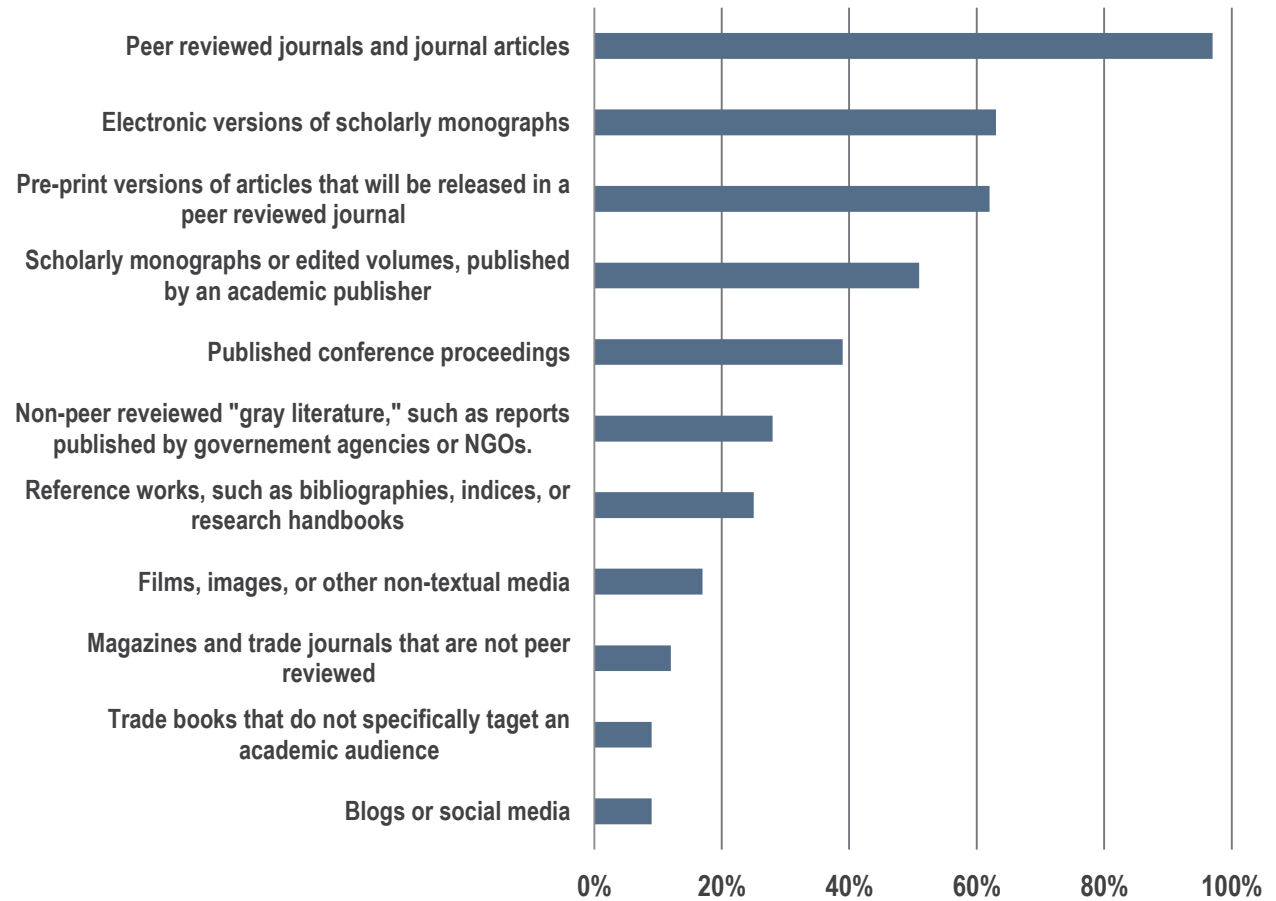
In addition to academic literature, respondents could also indicate that they used other material types in their research. Overall, these material types are less widely regarded as important, though the relative importance of material types again varies by discipline:

- About 39% rate 'published conference proceedings' as very important, with a slightly larger share of humanists and natural and physical scientists ranking these materials as important.

- About one quarter of respondents rank 'reference works such as bibliographies, indices or research handbooks' as very important, with substantial variation across disciplines. About 48% of humanists indicates that these materials were valuable to their research, while only about one in five academics from the medical sciences and natural and physical sciences regard reference works as very important.

- About 28% of respondents indicate that 'non-peer reviewed 'grey literature' such as reports published by government agencies or NGOs' are very important to their research, though 41% of academics from the social sciences regarde these materials as valuable. These patterns are consistent with those apparent in responses from the US, and reflect the distinct research questions and practices constitutive of academic work in the social sciences.

- Materials that target a general audience, including 'magazines and trade books that are not peer reviewed', 'trade books that do not specifically target an academic audience' and 'films, images and other non-textual media' are rated as very important by a small share of respondents, with notable differences in responses from humanists (a larger share of whom rated these materials as important). This suggests that humanists may rely more heavily on these materials as primary sources.

- 'Blogs or social media' are not highly regarded by academics from any discipline, or from any country. [19] As media like these continue to emerge as avenues for expression, dialogue and review, Ithaka S+R will continue to monitor if and how academic attitudes about them evolve.

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[19] Although not defined more precisely in the survey, this could refer to either mainstream tools like Facebook and Twitter, or services specifically for the academy like MLA Commons. In the future, we may seek to differentiate between these types of tools and services.
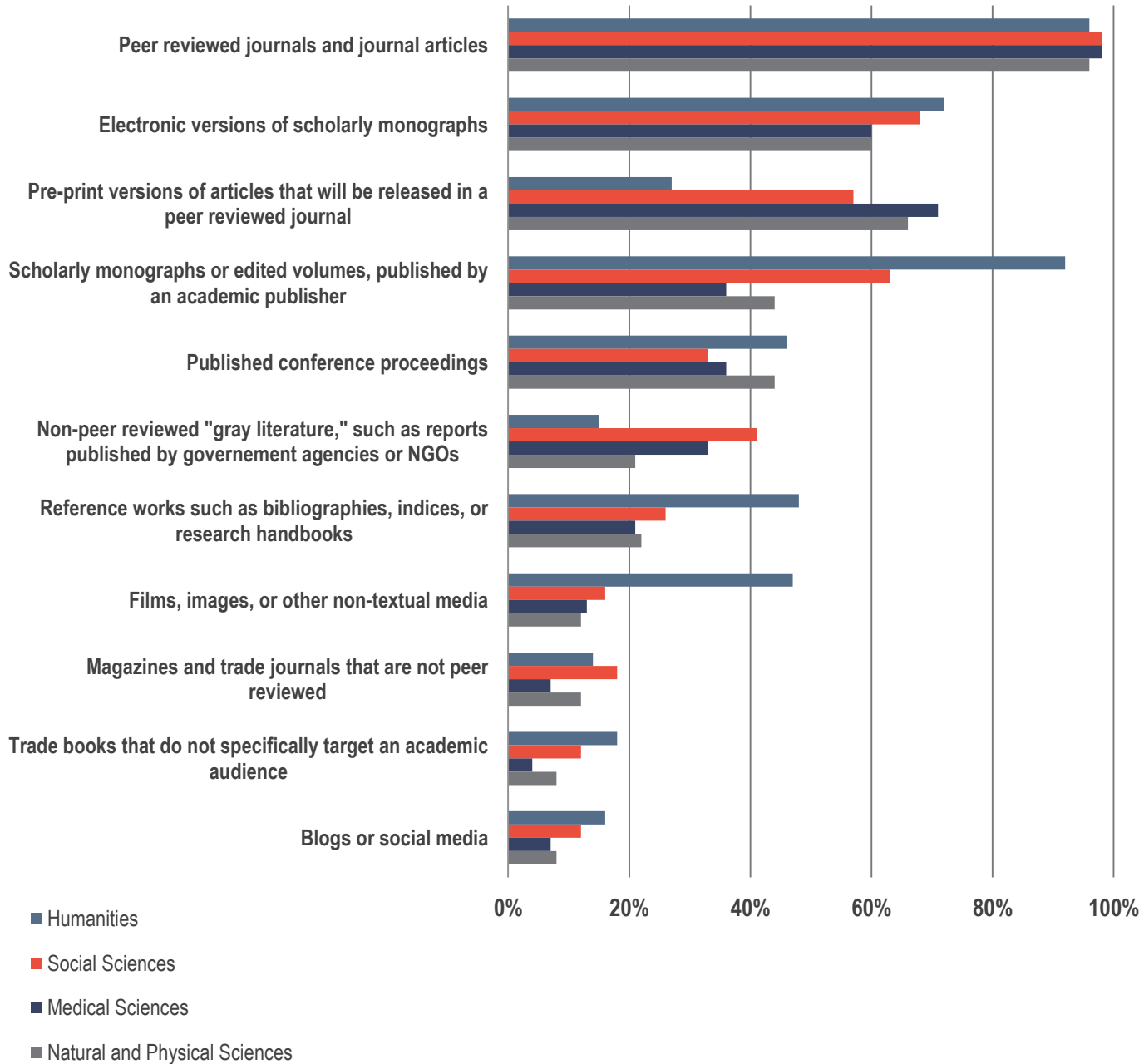
Table 27
Academics draw on a variety of different types of scholarly materials in their research.
How important _to your research_ is each of the following types of materials?*

*Percent ranking each material type as 'extremely important' (8-10 on a 10-point scale).

Table 28
Academics draw on a variety of different types of scholarly materials in their research. How important _to your research_ is each of the following types of materials?*

*Percent ranking each material type as 'extremely important' (8-10 on a 10-point scale), by disciplinary grouping.

Research Dissemination

It is difficult to overstate both the actual and future potential of digital technologies in transforming the ways in which academics communicate with each other. As traditional modes of scholarly communication, including journals and books, have been made available online, the marketplace for these materials has changed considerably. Additionally, new media and variations on traditional formats have offered up new opportunities for communication among scholars. In Australia in particular, the government has been active in supporting the development of electronic infrastructure to facilitate the dissemination of research findings, including open access institutional repositories.[20] Additionally, the incentive structure for academic publishing is relatively clearly defined through the Excellence in Research in Australia metrics, which shapes publishing choices by providing guidance to academics on how their research choices will be evaluated. Within this context of existing guidelines, funding incentives, and technological innovations, the G08 survey seeks to understand how academics make choices related to publishing and research dissemination.[21]

Audience

To shed light on how academics value their work's impact on various groups, the survey included questions that asked respondents to rank how important it is to them that their work reaches different types of audiences, from scholars in their specific sub-discipline, to undergraduates, to general audiences outside of academia. Responses to this question indicate that academics are most focused on reaching academics within their specific sub-discipline or field of research. Academics in one's field but outside of a respondent's specific sub-discipline constitute a less important—though still highly valued—potential audience. It was less important to respondents that their work reach academics outside of their discipline, with only 42% ranking this audience as very important. Of all of the audiences available for ranking, undergraduates are regarded as an important audience by the fewest respondents, with roughly three out of ten academics surveyed reporting this group as one that is very important to reach.

When compared to responses from Ithaka S+R's US Faculty Survey 2012 and UK Survey of Academics 2012, the findings are remarkably similar. That said, a substantially larger share of academics from Australia say it was important that they reach 'professionals outside of academia in areas related to my research and interests'. This difference might
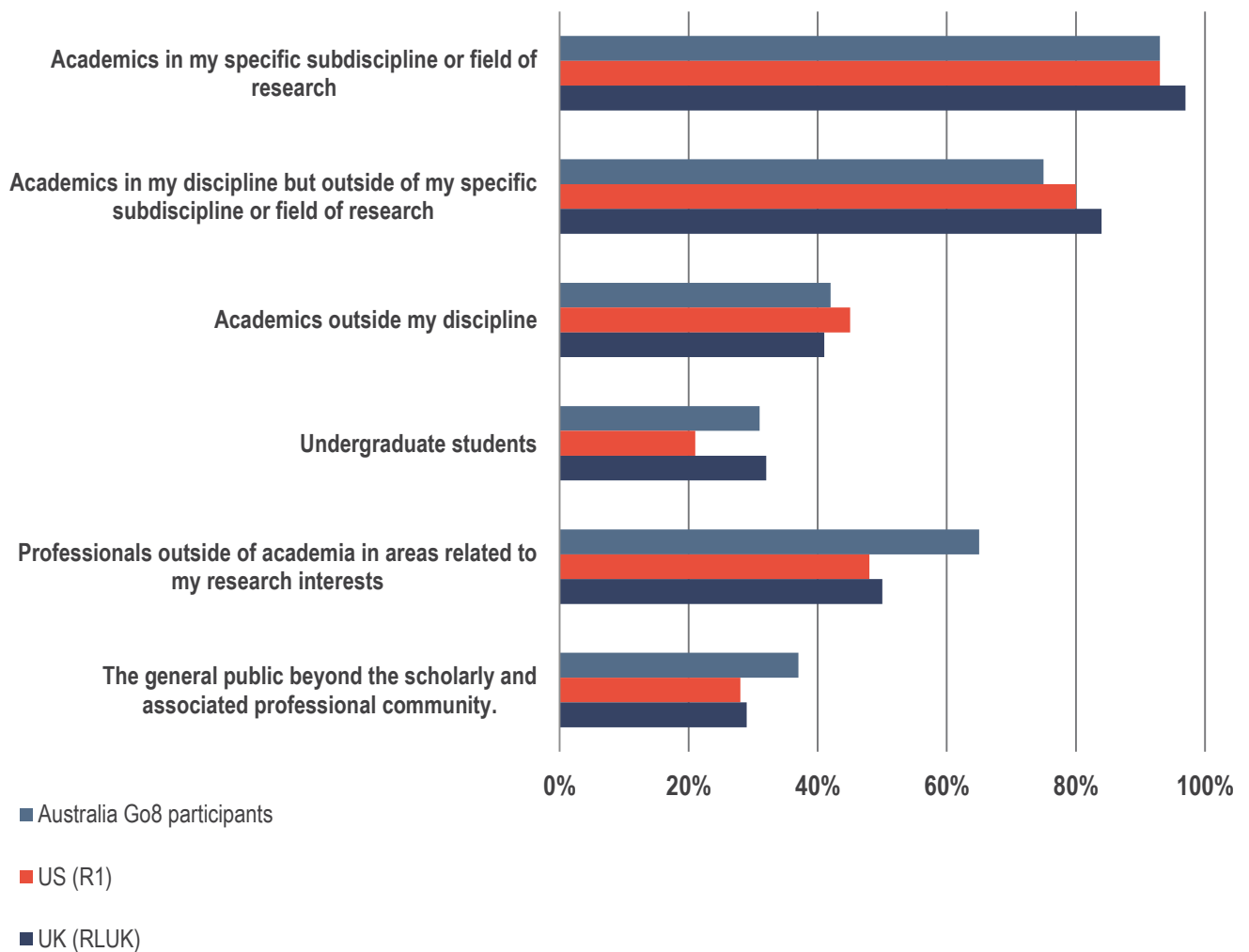
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20 See Mary Anne Kennan and Danny A. Kingsley, 'The State of the nation: A snapshot of Australian institutional repositories', University of New South Wales (October 2008), https://digitalcollections.anu.edu.au/bitstream/1885/49377/4/StateoftheNation.preprint.pdf.

21 Kim Carr, 'New era in research will cut the red tape,' The Australian, July 15 2009, http://www.theaustralian.com.au/news/new-era-in-research-will-cut-the-red-tape/story-e6frg6n6-1225750118068?nk=ed9dc9688b1655c776ece351395dea2d.

be due to the disciplinary distribution of Australian respondents, amongst whom there were fewer respondents from the humanities than other fields. Nearly three-quarters of respondents from the medical sciences and social sciences indicate that communicating with professionals from outside of academia is important. This may reflect strong connections extant between social scientists and policy makers, and between medical researchers and practitioners. While a smaller share of respondents from all fields regard the general public beyond the scholarly community as a key audience, notably fewer natural and physical scientists (29%) than humanists (43%) and social scientists (44%), identify this group as a very important audience.

Table 29
How important is it to you that your research reaches each of the following possible audiences?*

■ Australia Go8 participants

■ US (R1)

■ UK (RLUK)

*Percent ranking each audience as 'extremely important' (8-10 on a 10-point scale), by country.
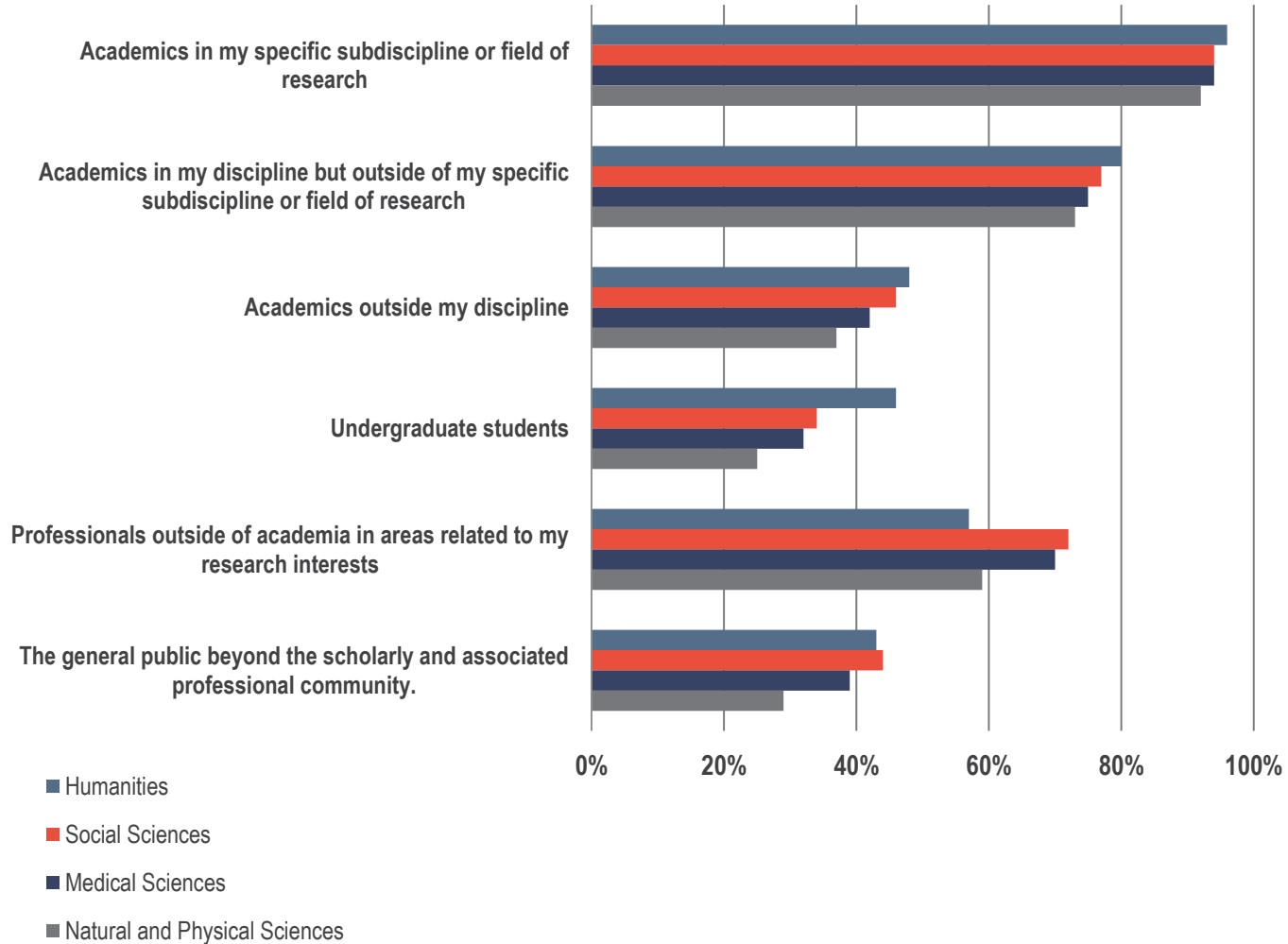
Table 30

How important is it to you that your research reaches each of the following possible audiences?*

*Percent ranking each audience as 'extremely important' (8-10 on a 10-point scale), by disciplinary grouping.
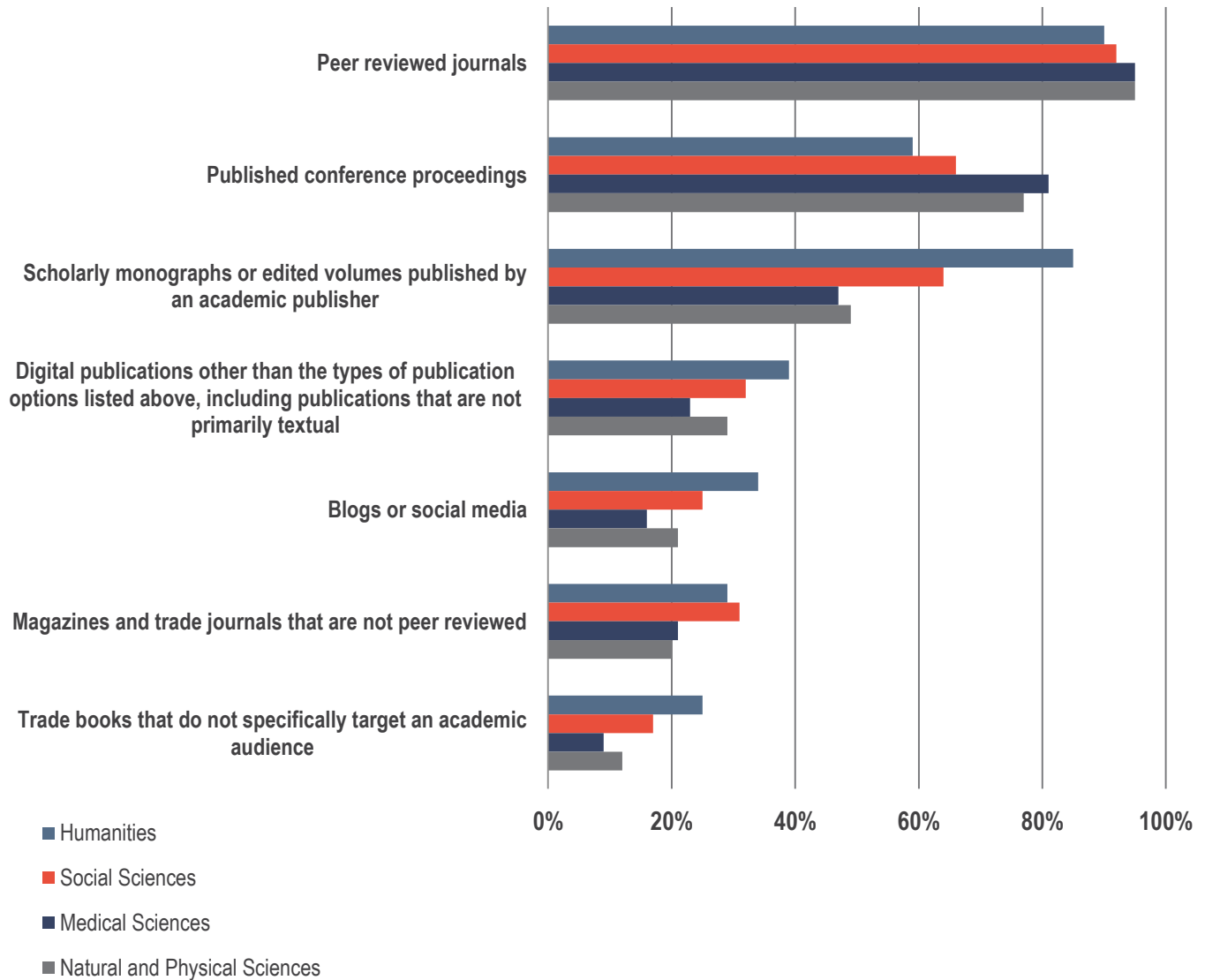
Publishing Channels

Just academics identify their immediate peers as their most vital audience, they also choose journals based on which ones will likely have the greatest impact on academics in their field. When asked about the frequency with which they utilize various formats to share their research, respondents indicate that they publish their work most often in academic, peer-reviewed journals. They are most likely to choose journals based on how relevant its area of coverage was to their field and how widely circulated the journal is amongst their peers.

Respondents from all disciplines report publishing to journals more so than to any other channel. Other formats, however, are clearly utilized more by academics from some disciplines than others. Just as humanists are more likely to use monographs in their own research and teaching, 85% of them report publishing to this medium often or occasionally, while less than half of respondents from the medical sciences and natural and physical sciences answer in the same way. A relatively larger share of respondents from the medical sciences and natural and physical sciences report publishing in conference proceedings. These distinctions might help to explain why, when compared to results from the US Faculty Survey 2012, it appears that Australian academics publish in conference proceedings more often, and in scholarly monographs less frequently.

Respondents report that they infrequently publish their work to formats designed to reach broader audiences outside of academia---a finding that remains consistent with the relatively small share of academics who say it is very important that their research reach a general audience. Less than a quarter of respondents say that they share their findings in non-peer reviewed magazines, trade books, and blogs or social media. A slightly larger share indicate that they often or occasionally share their research in 'digital publications other than the types of publications listed above, including publications that are not primarily textual'. Though an amorphous and non-specific set of publications, this category will be interesting to monitor over time as the landscape of avenues available for making research public shifts.

Table 31

Indicate how often you have shared the findings of your academic research in each of the following ways in the past five years.*

Legend:
- Humanities
- Social Sciences
- Medical Sciences
- Natural and Physical Sciences

*Percent of respondents reporting that they shared their work in each format 'often' or 'occasionally' in the past five years, by disciplinary grouping.

Clearly, a larger share of academics publish their work in peer-reviewed journals than they do in any other medium. However, academics may weigh a variety of different considerations when deciding to which journal to publish. To provide insight into this, respondents were asked to rank a variety of journal characteristics based on how important each one is when targeting a journal for publication. In general, the results
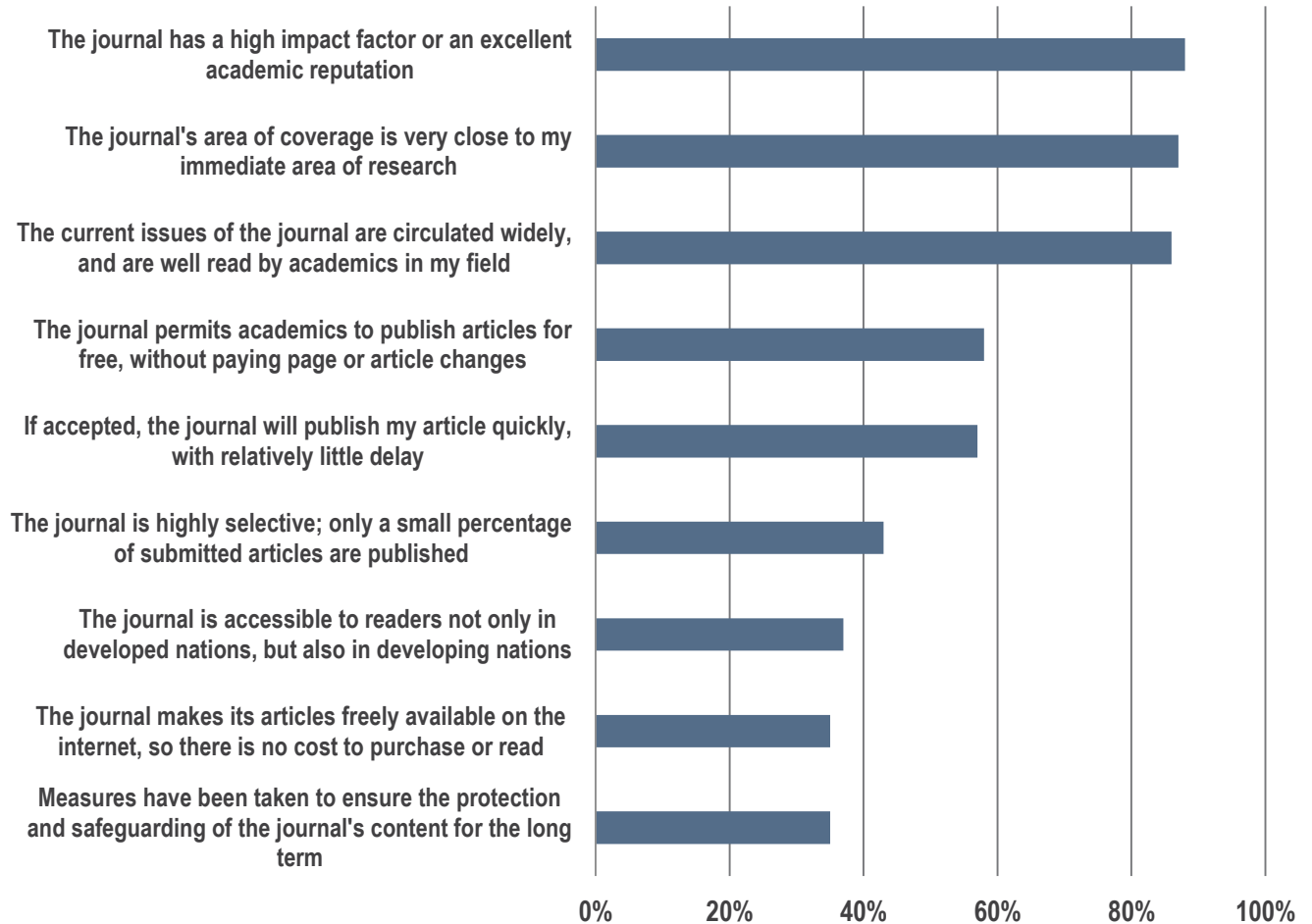
here mapped consistently onto academics' responses regarding the audiences they hoped to reach. Just as a substantial majority indicate that it is very important that their work reach academics within their discipline, so too do a large share (87%) say that it is very important that a journal's area of coverage is very close to their immediate area of research. Similarly sized shares report that it is very important that the journal has a 'high impact factor', and that it is 'well read by academics within their field.

Respondents also favour factors related to how convenient journals made the publication process. Nearly 60% of respondents say that it is very important that a journal permit academics to publish articles for free, and, notably, seven out of ten humanists identify this as very important. Comparatively, roughly one-third of respondents say that it is important that the journal is free on the internet so that there is no cost to purchase or read (a factor that would make it easier for general audiences to access materials). Similarly, more than half of respondents from all disciplines note that the alacrity with which a journal published their article was an important deciding factor, and natural and physical scientists mark this as a particularly valuable characteristic.

Respondents tend to rank other factors as less important. Fewer than half of the respondents indicated that it was very important that a journal be highly selective, and, instead, academics tend to value the journal's impact factor more substantially. Factors like preservation are even less important, as were aspects related to access. Additionally, a relatively small share of academics identify the journal's accessibility to readers in developing nations as an important factor. These results were similar to the ones from Ithaka S+R's US Faculty Survey 2012 and UK Survey of Academics 2012, and no notable international differences emerged with respect to this question.

Table 32
When it comes to influencing your decisions about journals in which to publish an article of yours, how important to you is each of the following characteristics of an academic journal?*

*Percent of respondents ranking each factor as 'extremely important' (8-10 on a 10-point scale).

Perceptions of publishers

Academics from all disciplines still see publishers as valuable actors within the research and publication process. When asked to rank the extent to which they agreed with the statement 'academic publishers have been rendered less important to my process of

communicating scholarly knowledge by my increasing ability to share my work directly with peers online', only 16% agree strongly, with little variation across disciplines. Nearly half of respondents strongly disagree with this statement. These results bring into question recent claims that, because of the emergence of alternate forms of scholarly communication, academic publishing is becoming obsolete. Rather they suggest that publishers may have to shift their strategies to provide new services in order to remain relevant.

To provide insight into how publishers support academics, the survey asked respondents: 'thinking back to the last academic article or monograph that you published, how valuable to you were the activities performed by your publisher in each of the following aspects of this process?' Consistent with respondents from the US Faculty Survey 2012 and UK Survey of Academics 2012, Australian academics tend to rank the publisher's role in managing the peer review process to provide high-quality feedback as the most important, with three out of four respondents ranking this function highly. A majority of respondents also deem the publisher's marketing-oriented roles as very important. Nearly three-quarters of respondents say that their publisher's role in making their work visible and associating it with a 'reputable brand that signals its quality' are very important. Contrasted with the relatively smaller share of respondents who say that the publisher's copy-editing and layout services were valuable (53%), these results indicate that academics principally value publishers as markers of quality and instruments of publicity, rather than as providers of design and editing services.
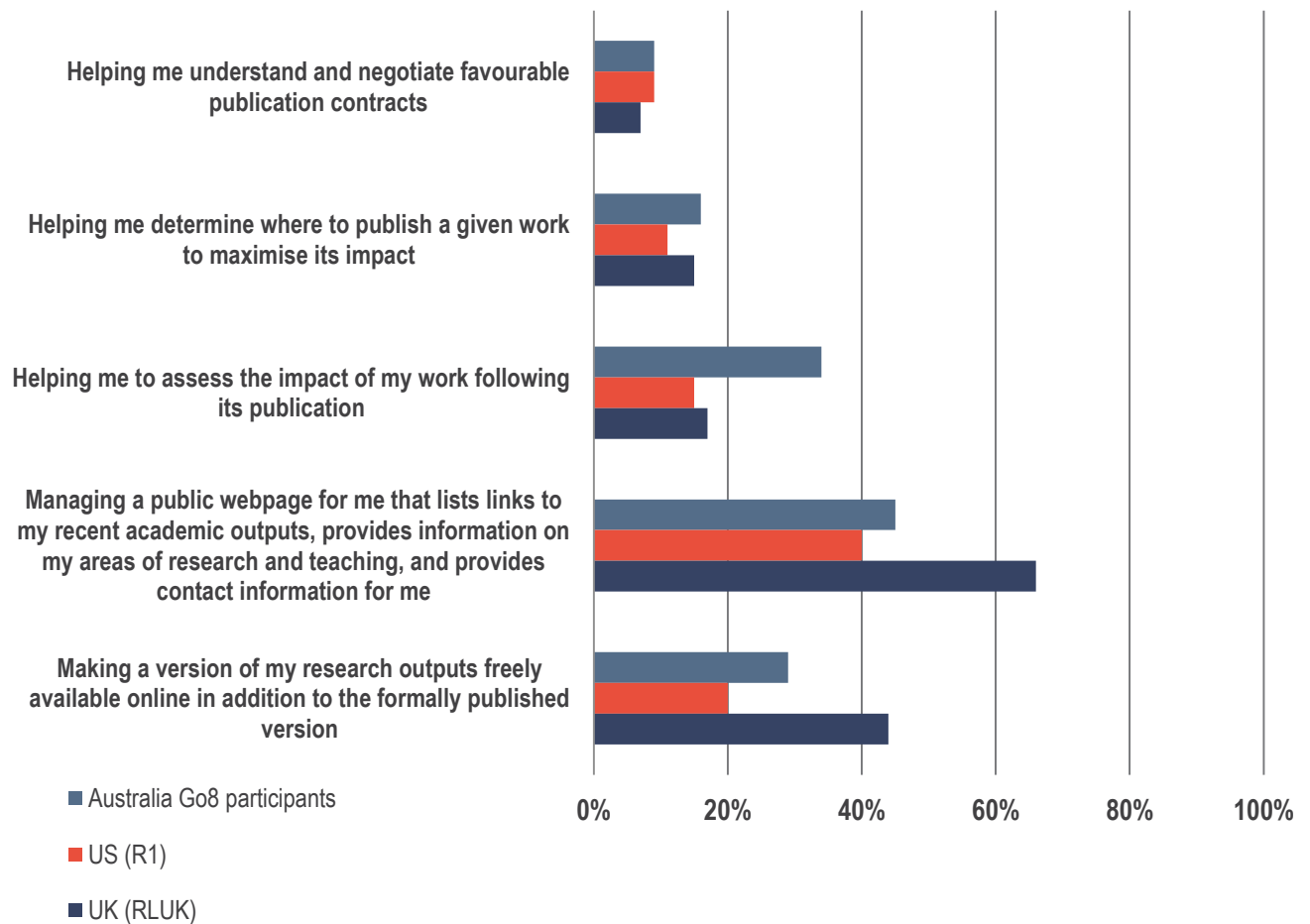
Research Support Services

In addition to querying academics about the roles played directly by publishers, the Go8 survey also included questions meant to gauge how academics' research dissemination activities could be better supported. Rather than identifying a single enterprise that would be the appropriate provider of such services, the survey asked academics about several research dissemination support services that could be offered by a library, scholarly society, university press, or another service provider.

Though respondents do not report that any of these services are extensively widespread, a slightly larger share of Australian respondents than US respondents indicate that they have access to these benefits. In particular, one in three Australian respondents say that their university, scholarly society, university press, or another service provider helps them assess the impact of their work following its publication. In comparison, only 15% of US respondents (from R1 institutions) and 17% of RLUK respondents indicate that they have access to these services. Across all three countries, the largest share of respondents report that they receive assistance managing a public webpage with links to recent academic outputs and contact information. More Australian than US respondents say they have access to this service, while a substantially larger share of academics from

the UK say they received help with this endeavour. Fewer respondents report that they receive help in understanding and negotiating favourable contracts and determining where to publish a work to maximise its impact.

Table 33
Does your university library, scholarly society, university press, or another service provider assist you with any of the following aspects of the publication process?*

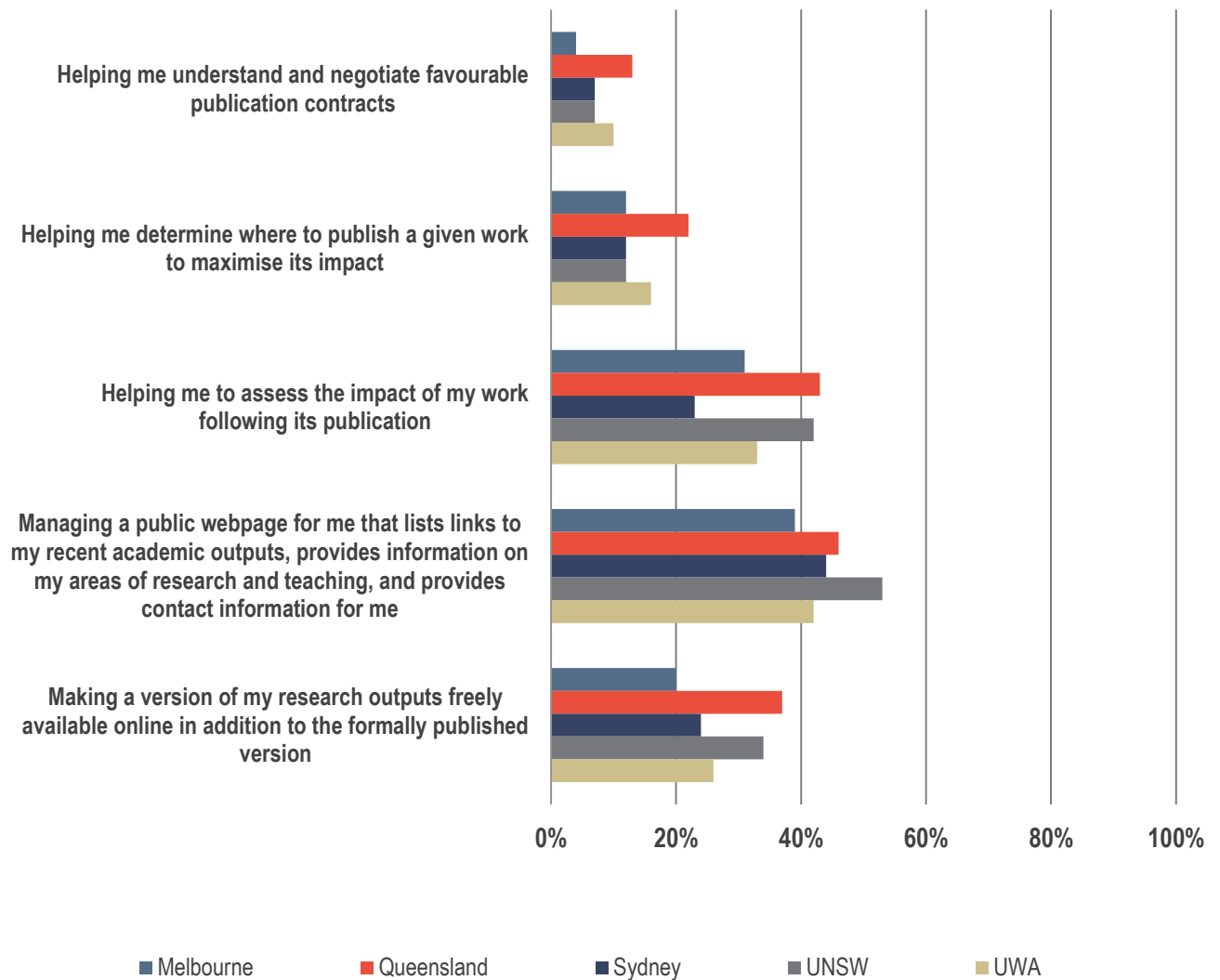■ Australia Go8 participants
■ US (R1)
■ UK (RLUK)

*Percent of respondents answering yes to each question, by country.

We did observe some considerable differences across institutions regarding the provision of these services. More than 40% of respondents from Queensland and UNSW indicate that they receive help assessing the impact of their work following its publication. A larger share of respondents from these institutions also indicate that they have access to services that made versions of their research outputs freely available online, and

academics from Queensland indicated that services that help them 'determine where to publish a given work to maximise its impact' and 'understand and negotiate favourable publication contracts' are more widespread than at other institutions.

Table 34
Does your university library, scholarly society, university press, or another service provider assist you with any of the following aspects of the publication process?*

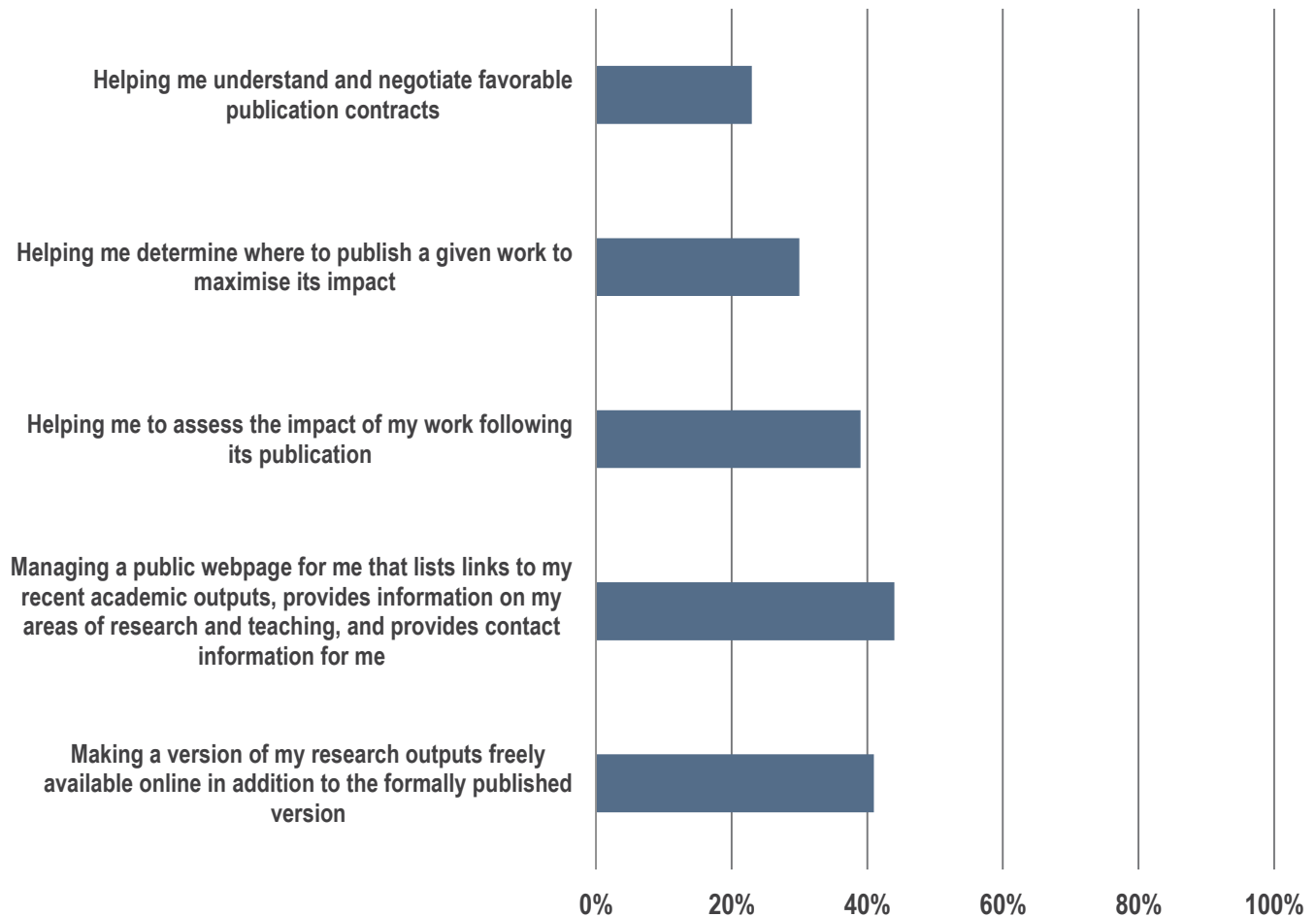*Percent of respondents answering yes to each question, by institution.

In addition to reporting on whether or not they receive these services, respondents also rated how 'valuable' each of these services would be to them, regardless of whether or not they could already obtain them. In general, those services to which more academics

have access are also those that more academics rank as valuable. When we filter answers to this question based on which services respondents indicate are available to them, we see that, when respondents report that they receive a given service, roughly six out of ten of those same respondents ranked these services as valuable. Academics tend to value services at higher rates than they reported receiving them. The one exception is in the case of services oriented around managing a public webpage. Though academics report this as the most widely available service, a very slightly smaller share of respondents rank it as very important as did those who said they had access to it.

An international comparison reveals similar trends as does an analysis of the availability of services, with slightly more Australian than US respondents ranking services that helped them assess the impact of their work as valuable. Overall, respondents tend to rank post-publication services (assessing a work's impact, managing a public webpage with links to academic outputs, making a version of research outputs available online) higher than those provided prior to a work's publication (negotiating contracts and determining where to publish a work to maximize its impact), though slightly more humanists and social scientists value these services than do academics from the medical sciences or natural and physical sciences. Just as a larger share of academics from University of Queensland report that they have access to most of the services listed, these respondents were more likely than their peers at the other surveyed institutions to indicate that they value these services highly.

Table 35

How valuable do you find or would you find support from your university library, scholarly society, university press, or another service provider for each of the following aspects of the publication process?*

*Percent indicating that they find or would find each form of support 'extremely valuable' (8-10 on a 10-point scale).

Open access and scholarly communication

In addition to publishing their scholarship in traditional journals or monographs, academics may also have the ability to make a final or pre-print version of their work available through a variety of other channels, including their website, a repository provided by their institution, or a cross-institutional repository focused on their field of

study. Though less than half of respondents indicate that any of these options is very important to them, a larger share of Australian academics rate all three channels as very important compared with responses from the US or the UK. In particular, 44% of Australian respondents identify 'a cross-institutional repository focused on my discipline or field of study' as very important, while only 30% of academics from the US, and 28% of academics from the UK value this channel as highly. These patterns likely reflect a more widespread culture of open access in Australia, where each institution houses its own repository and where the Australian Research Council and the National Health and Medical Research Council require that all outputs of government funded research be deposited into an open access repository.[22]

The survey's exploration of how academics value digital channels referred to both pre-print and final versions of their work. In addition, it included questions targeted to evaluate how academics specifically view pre-print versions of their research as an important form of scholarly communication. Among the academics surveyed, roughly one third agree strongly with the statement 'circulating pre-print versions of my research outputs is an important way for me to communicate my research findings with my peers', with substantially more social scientists and physical and natural scientists than humanists ranking this statement highly. This result remains consistent with the finding that academics from these disciplines rely on pre-print versions of research outputs more heavily when it comes to 'keeping up' with research in their field.

Research Topics, Digital Research, and Data Management

In recent years, the introduction of new technologies has changed the ways that academics conduct research.[23] In recognition of this, Ithaka S+R has set out to explore practices, methods and associated research support services needs in a variety of key fields.[24] The Go8 Survey complements these highly discipline-specific projects with a set of broader diagnostic questions to examine research practices and methods across the academy at the national level. As a cross-institutional tracking survey of academics across a range of disciplines, the Go8 survey is well-suited to assess how widespread certain behaviours are across disciplines and to lay the groundwork to track change over time. Consequently, this report focuses on the impact of digital technology on changing research practices, and academics' need for support in integrating digital technology more deeply into their work.[25]

Digital Research Activities and Methodologies

Even if only through changes in accessing materials or communicating findings, digital technologies have surely touched every researcher's life. In some cases, the impact of digital technology has been truly transformative. It has enabled the analysis of massive and otherwise intractable datasets, allowed for the development of sophisticated computer models, and created conditions that make possible the engagement of the general public in 'citizen science' efforts.[26]

To explore how these changes effect academics from varied fields, the survey included questions designed to gauge what sorts of research methods academics use, whether they

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[23] John W. Houghton, Colin Steele, and Margaret Henty, 'Research Practices, Evaluation and Infrastructure in the Digital Environment', Australian Academic and Research Libraries, September 2004, http://www.tandfonline.com/doi/pdf/10.1080/00048623.2004.10755269

[24] Matthew Long and Roger C. Schonfeld, Supporting the Changing Research Practices of Art Historians (New York: Ithaka S+R, 2014) available at http://www.sr.ithaka.org/research-publications/supporting-changing-research-practices-art-historians; Matthew Long and Roger C. Schonfeld, Supporting the Changing Research Practices of Chemists (New York: Ithaka S+R, 2013) available at http://www.sr.ithaka.org/research-publications/supporting-changing-research-practices-chemists; Jennifer Rutner and Roger C. Schonfeld, Supporting the Changing Research Practices of Historians (New York: Ithaka S+R, 2012), available at http://www.sr.ithaka.org/research-publications/supporting-changing-research-practices-historians.

[25] See John Houghton et al, 'Research Practices, Evaluation and Infrastructure in the Digital Environment'; 'Reinventing research? Information practices in the humanities,' Research Information Network, April 2011, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1859267.

[26] See for example The Atlas of Living Australia, http://www.ala.org.au/.

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are interested in incorporating digital methods into their research processes, and what sorts of impediments might prevent them from doing so. In general, results indicate that academics from the social sciences, medical sciences and natural and physical sciences have begun to embrace digital research methods, while humanists tend to feel that new practices might not be relevant or valuable to the types of research that they conduct.

First, respondents were presented with a list of digital research methods, approaches and activities and asked to rank the importance of each item to their work. This list was not designed to be normative, but rather to explore a set of methods expected to grow in frequency of use. In their responses, more than three out of four academics from the medical sciences and natural and physical sciences indicate that the analysis of quantitative data generated through the course of their research was very important, and nearly one-half of social scientists report that this activity was valuable. A smaller, though still substantial, share of respondents from these fields also indicate that they use digital tools to analyse pre-existing quantitative data that they did not generate throughout the course of their research, with a slightly smaller share of social scientists describing this as an important practice. It would be interesting to track the changing importance of these methods over time, given the diverse efforts to assemble large-scale datasets on topics from astronomy and environmental science to social media records.
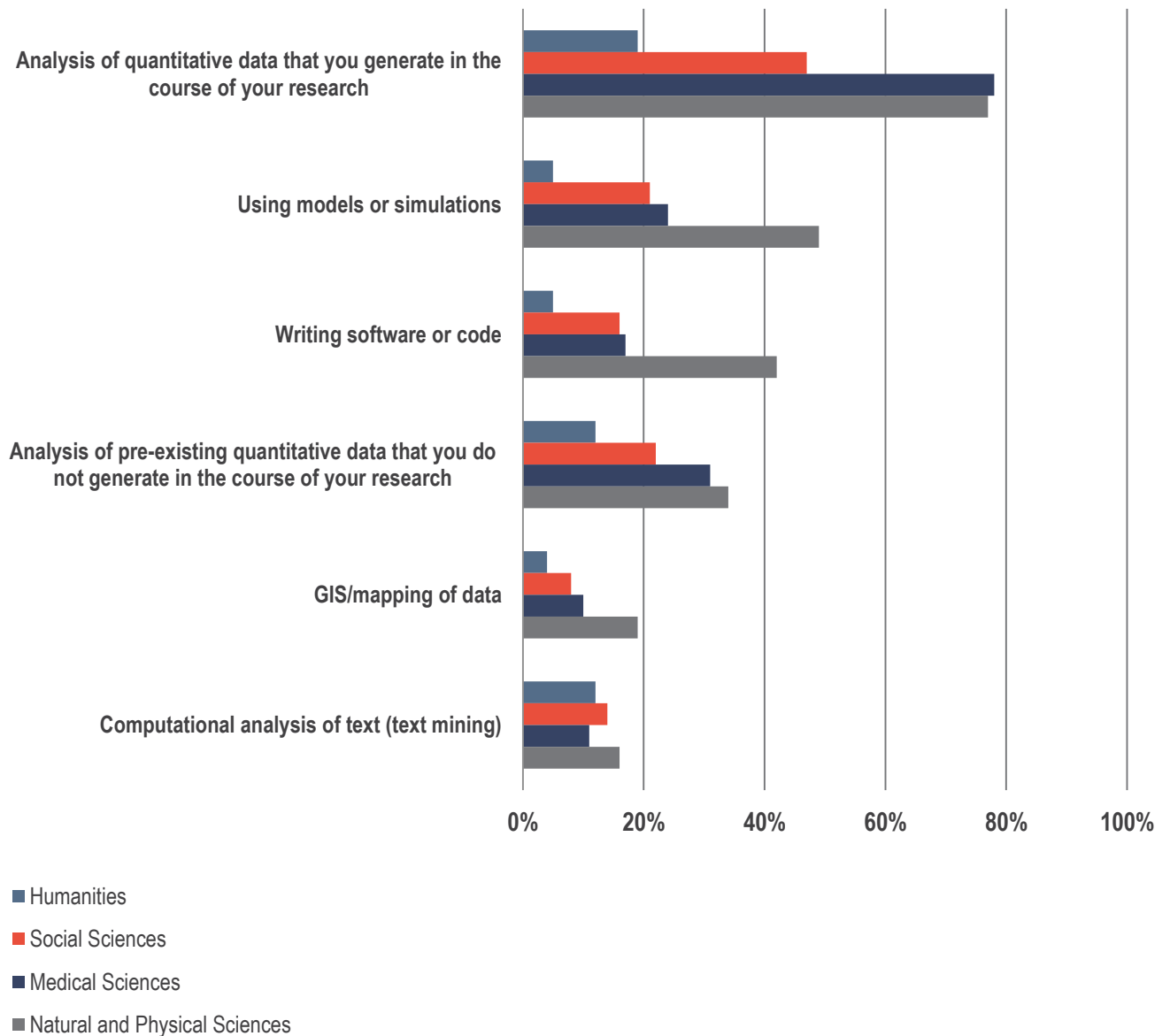
Overall, a larger share of natural and physical scientists than respondents from any other disciplinary grouping tend to rank all digital practices as very important. This pattern deviates from US survey results, where a relatively larger share of respondents from the social sciences rate 'models and simulations' and 'computational analysis of text' as more valuable. Though text mining receives the fewest high ratings from scientists than any other item on the list, a relatively larger share of them mark this practice when compared to academics from any other group.

As in the US and UK, a far smaller share of humanists indicate that any of these digital methods are very important to their research. Even methods usually thought of as applicable to the digital humanities—such as text mining and GIS mapping—are ranked as important by only a small share of respondents from the humanities. The most widely used method amongst humanists—'analysis of quantitative data that you generate in the course of your research'—is also the most commonly used method among academics from other disciplines, and humanists report using digital methods to analyse pre-existing data just as often as they do text mining. These patterns might suggest that humanists rely more on practices adopted from other fields than they do on unique approaches developed within their discipline, though we would need to further investigate how humanists employ digital methods in order to support these assertions.

It is possible that humanists use methods like quantitative analysis in novel ways specific to and generative for the sort of research they conduct.[27]

Table 36
How important to your research is each of the following digital research activities and methodologies today?*

- Humanities
- Social Sciences
- Medical Sciences
- Natural and Physical Sciences

*Percent of respondents ranking each method as very important (8-10 on a 10-point scale), by disciplinary grouping.

[27] See Christine Borgman, 'The Digital Future is Now: A Call to Action for the Humanities', Digital Humanities Quarterly, January 2, 2010, http://digitalhumanities.org/dhq/vol/3/4/000077/000077.html /000077.html.

Just as humanists rely less on digital methods for their research, they also report less interest in exploring these practices than do respondents from other fields. While nearly half of respondents from the social sciences, medical sciences and natural and physical sciences say that they are very interested in integrating research activities and methodologies more deeply into their work, only one in four humanists feels the same way, and nearly half say they are not interested in making these changes at all.

Of those who indicate a strong interest in adopting new research methodologies, academics identify a number of factors that prevented them from doing so. More than half of the respondents say that they are unable to devote enough time to integrate these technologies, and nearly half indicate that they do not have the sufficient technical skills to make this transition effectively. Roughly one-third of respondents report that they are unsure of how these activities can support their research goals.

The smallest share of respondents—about one in five—indicate that tenure and promotion decisions prevent them from integrating digital research activities into their work, though a notably larger share of humanists (one in three) identify this as a limiting factor. This might reflect more general professional and cultural traditions within humanities departments, and could help to explain the apparent reluctance amongst humanists to adopt new approaches.[28] Indeed, among the humanists who indicate that they are not interested in incorporating digital approaches into their research, one half strongly agree with the statement 'digital research activities and methodologies are not valuable or important for the type of research I am interested in performing'.
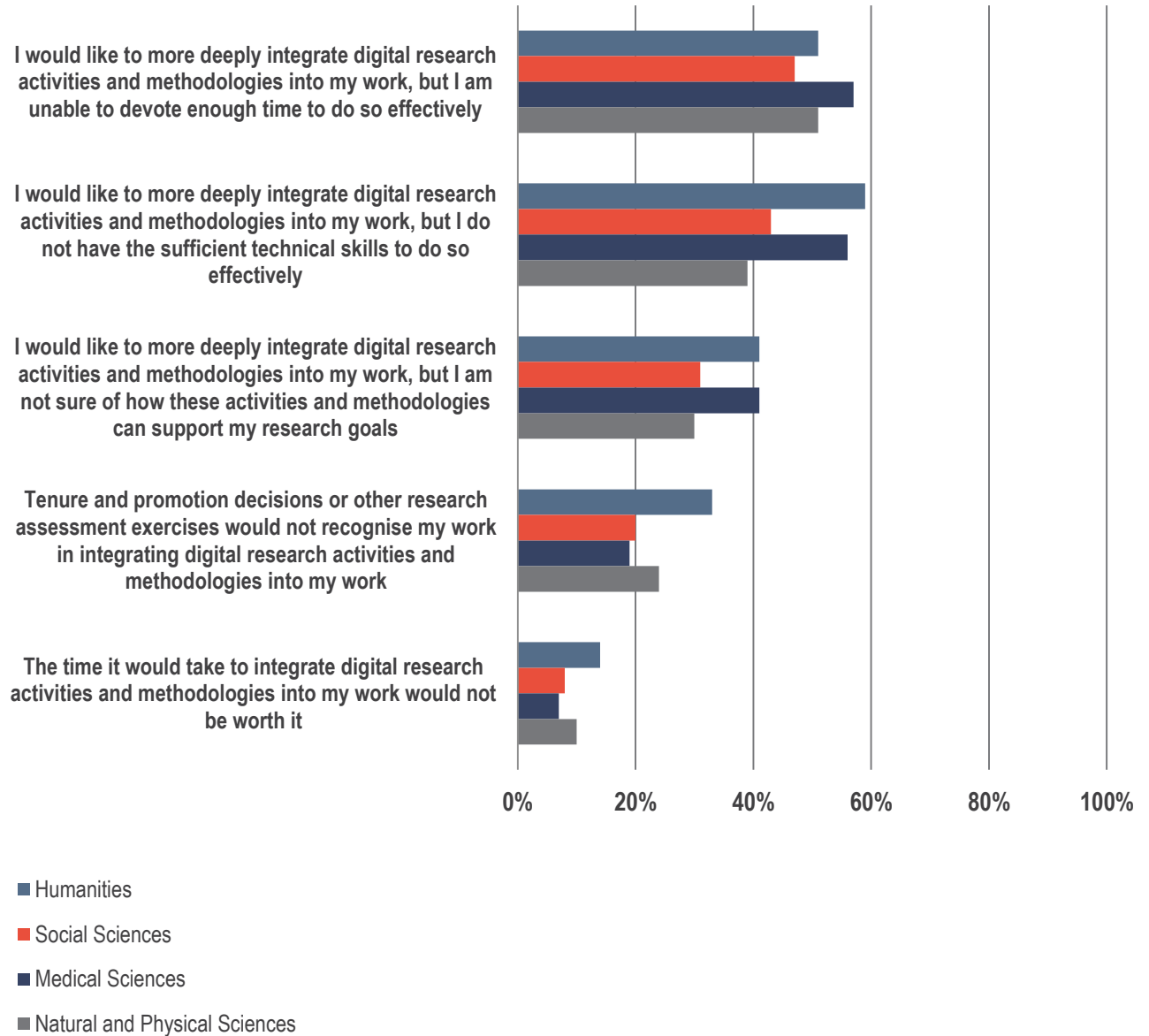
Additionally, though tenure and promotion considerations constitute the least frequently identified constraint on digital research methodologies, a slightly larger share of Australian (23%) than US respondents from R1 institutions (12%) rank this is a considerable limitation. When respondents rank how well the statement 'I shape my research outputs and publication choices to match the criteria I perceive for success in tenure and promotion processes', a similar pattern surfaces. Roughly 40% of Australian respondents say that this describes their point of view very well, while 30% of US respondents share this attitude.[29]

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[28] See Carl Straumsheim, 'How hip are digital humanities?' The Australian, May 12, 2014, http://www.theaustralian.com.au/higher-education/how-hip-are-digital-humanities/story-e6frgcjx-1226914366158.
[29] Response patterns might reflect different promotional practices between the two countries, especially as tenure is no longer offered at Australian universities.

Table 37
Academics' opinions about digital research methods.

*Of those respondents who selected 'I am very interested in integrating digital research activities and methods…more deeply into my work', percent who agreed strongly with each option (8-10 on a 10-point scale), by disciplinary grouping.
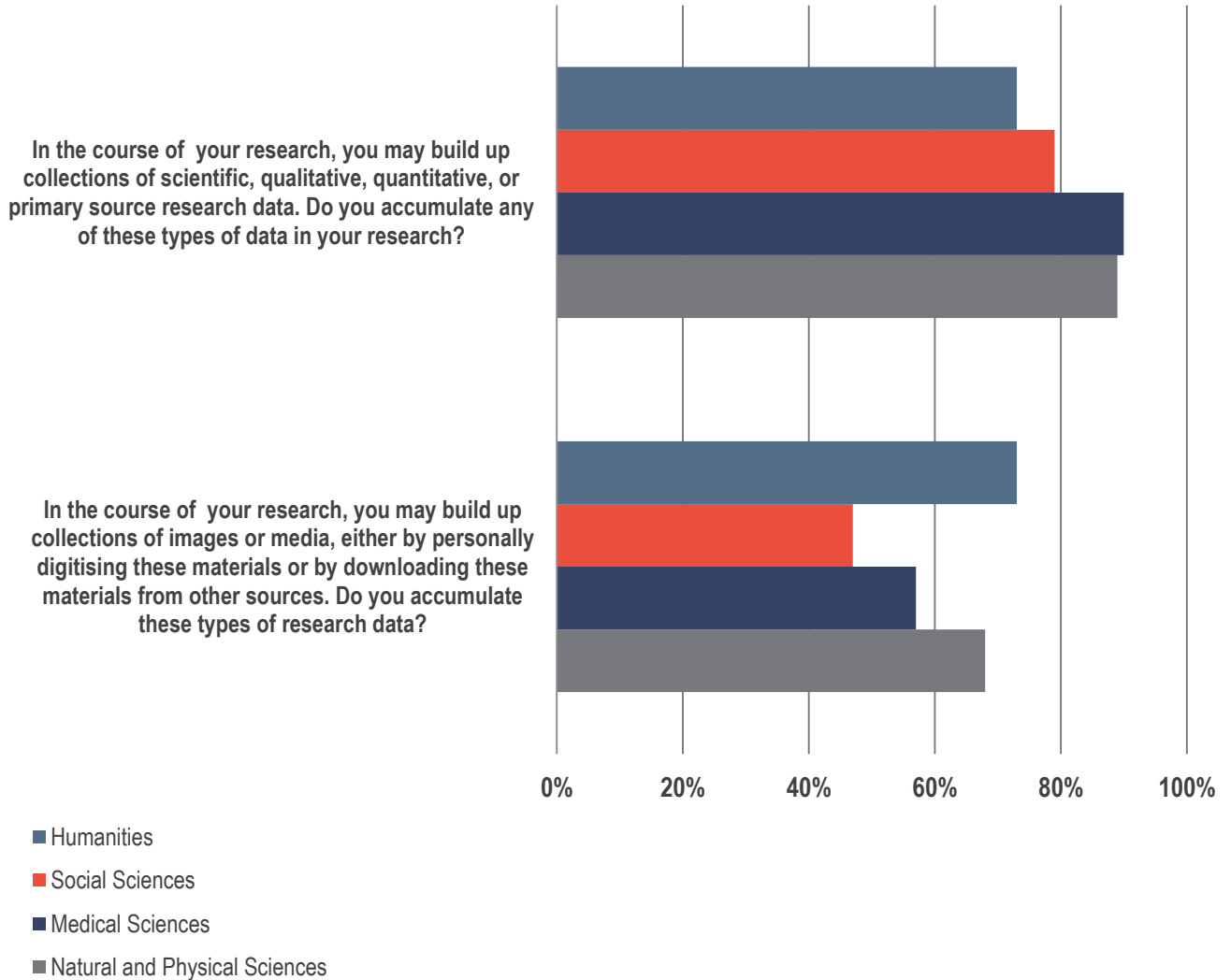
Data Management

As academics come to utilize digital research methods more widely, the way that they organise, manage and preserve data may need to be reconsidered, and the materials

from which they draw will be subject to a number of questions regarding access, permissions, storage, tracking, and collaboration. While questions regarding academics' research methods shed light on how technological innovation has changed research practices, the survey also examined how researchers manage the data with which they work, and what sorts of services they might find the most valuable to organise and preserve these materials.

To ensure that the Go8 survey captured the 'data' and the raw research materials used by academics in a variety of fields, the instrument included questions about two distinct, yet related, sets of resources and asked participants how they work with, manage, and preserved each. First, respondents were asked if they accumulated collections of 'scientific, qualitative, quantitative, or primary source research data'. Of the academics surveyed, 85% indicate that they keep collections of this sort, with a slightly smaller yet still substantial share of humanists reporting that they use these materials. Second, respondents were asked if they built up collections of 'images or media, either by personally digitising these materials or by downloading these materials from other sources'. Here, a slightly smaller share—about six in ten respondents—report that they maintain such collections. A larger share of humanists and natural and physical scientists—around seven in ten-- say that they build collections of images and digital media, while about one half of social scientists say they maintain collections with these materials.

Table 38

Data collection and accumulation by disciplinary grouping.*

- ■ Humanities
- ■ Social Sciences
- ■ Medical Sciences
- ■ Natural and Physical Sciences

*Percent of respondents answering yes to each question, by disciplinary grouping.

Of those respondents who indicate that they maintain collections of scientific, qualitative, quantitative, or primary source data, the largest portion (88%) report that their own collections—as opposed to those collected by other researchers or at other institutions--are the most important to their research. Roughly one half of respondents report that datasets collected by other researchers within their field (either within or outside of their university) are very important, while a similar share value datasets that are freely available online. The smallest portion—about one in four respondents—say they rely on datasets collected by researchers outside of their field.

Table 39
How important to your research are the following types of data digital image or media collections?*

Data/media that I collect/compile myself

Data/media collected/compiled by other researchers in my field at my university

Data/media collected/compiled by other researchers in my field at other institutions

Data/media that I access through my university library's subscription to an online repository

Data/media that are freely available online

Data/media collected/compiled by other researchers outside my field

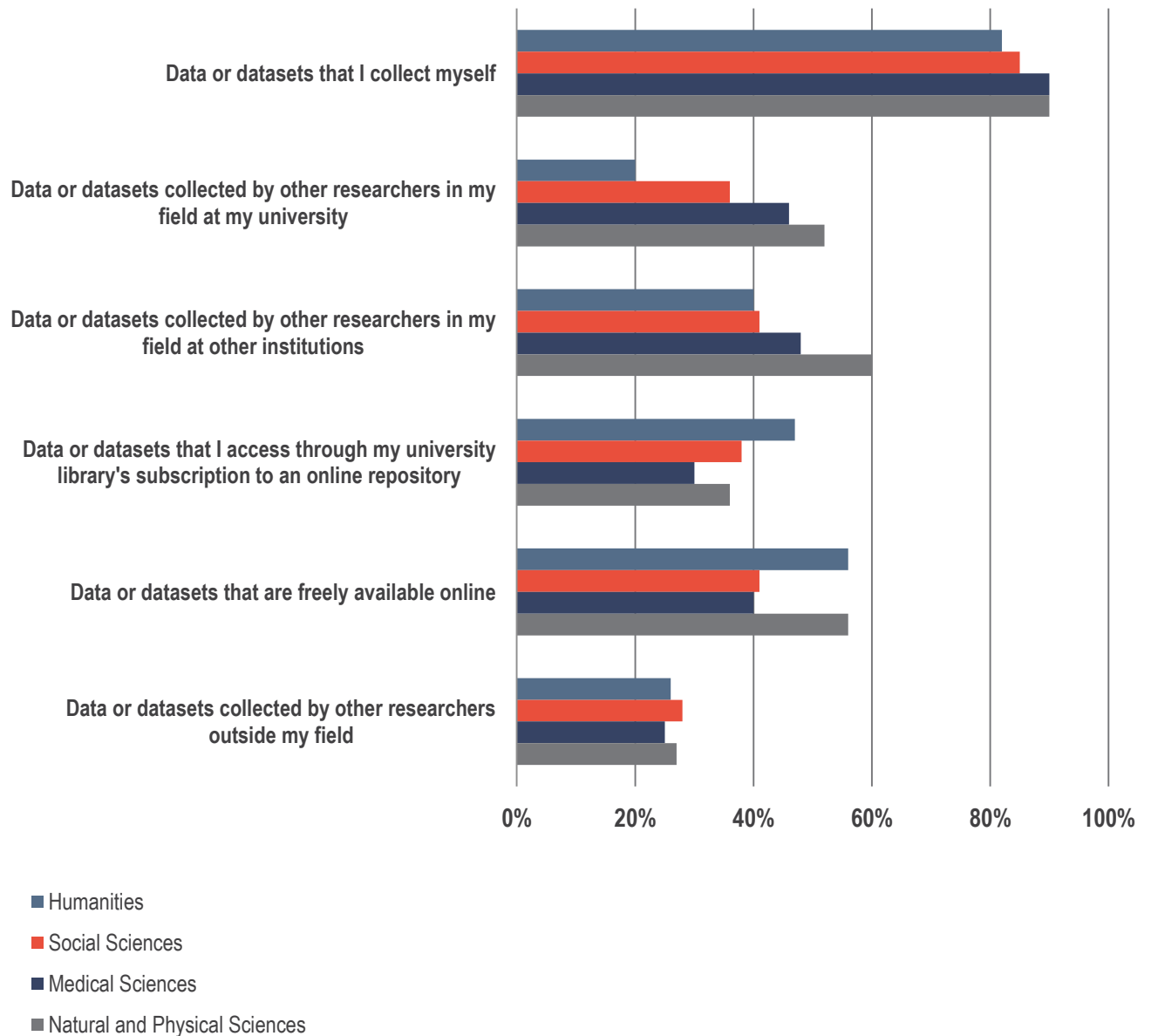■ Data or datasets

■ Sets of digital images or media

*Percent of respondents ranking each collection type as 'extremely important' (8-10 on a 10-point scale), by data type.

When we break these results down by discipline, a few notable differences emerge. First, there exists a considerable range in terms of how respondents rat the importance of datasets collected by other researchers in their field at their university. While roughly one half of academics from the medical sciences and natural and physical sciences rank this as very important, only one third of social scientists and one in five humanists regard these collections highly. This might reflect various cultures of collaboration within departments, particularly because academics from the sciences often use datasets

collected by researchers that work in their labs. Conversely, humanists are more likely than any other disciplinary group to regard datasets accessed through their university library's subscription to an online repository as very important, while a larger share of humanists and natural and physical scientists rank datasets that are freely available online as valuable.

Table 40
How important to your research are the following types of data?*

■ Humanities

■ Social Sciences
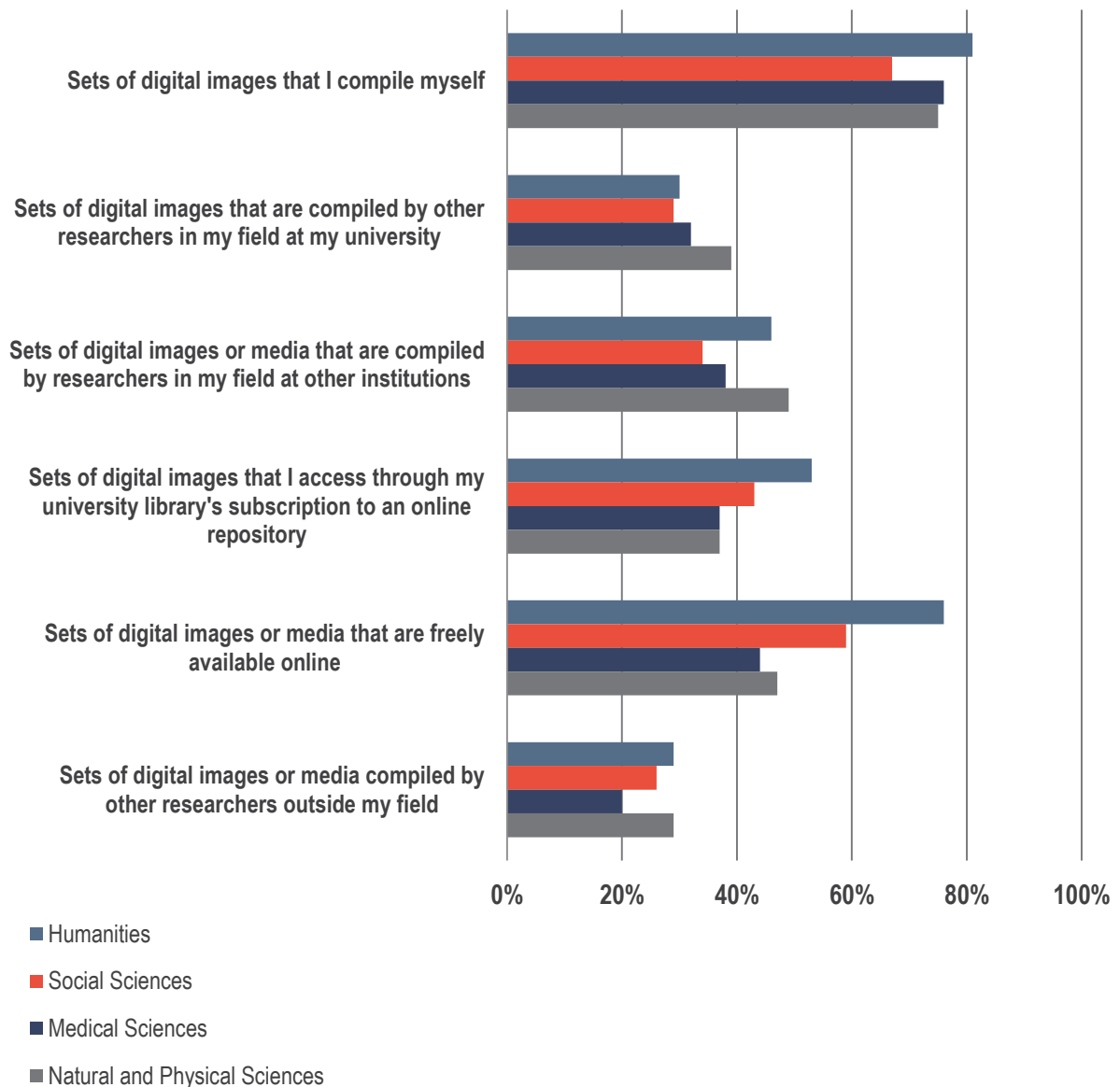
■ Medical Sciences

■ Natural and Physical Sciences

*Percent of respondents ranking each collection type as 'extremely important' (8-10 on a 10-point scale), by disciplinary grouping.

Similar patterns emerge in responses to questions about digital collections of media and images, though, on the whole, fewer respondents rank each option as very important. One in four respondents indicate that sets of digital images or media that they compile themselves are very important to their research, and this was the most highly rated choice by a substantial margin. Respondents who used digital images and media tend to place slightly more value on collections that are freely available online, and larger shares of humanists and social scientists are especially inclined to rate these sorts of collections highly. Again, only one in four respondents rank collections compiled by researchers outside of their field as important.

Table 41

How important to your research are the following types of digital or media collections?*

Chart categories (top to bottom):
- Sets of digital images that I compile myself
- Sets of digital images that are compiled by other researchers in my field at my university
- Sets of digital images or media that are compiled by researchers in my field at other institutions
- Sets of digital images that I access through my university library's subscription to an online repository
- Sets of digital images or media that are freely available online
- Sets of digital images or media compiled by other researchers outside my field

Legend:
- Humanities
- Social Sciences
- Medical Sciences
- Natural and Physical Sciences

*Percent of respondents ranking each collection type as 'extremely important' (8-10 on a 10-point scale), by disciplinary grouping.
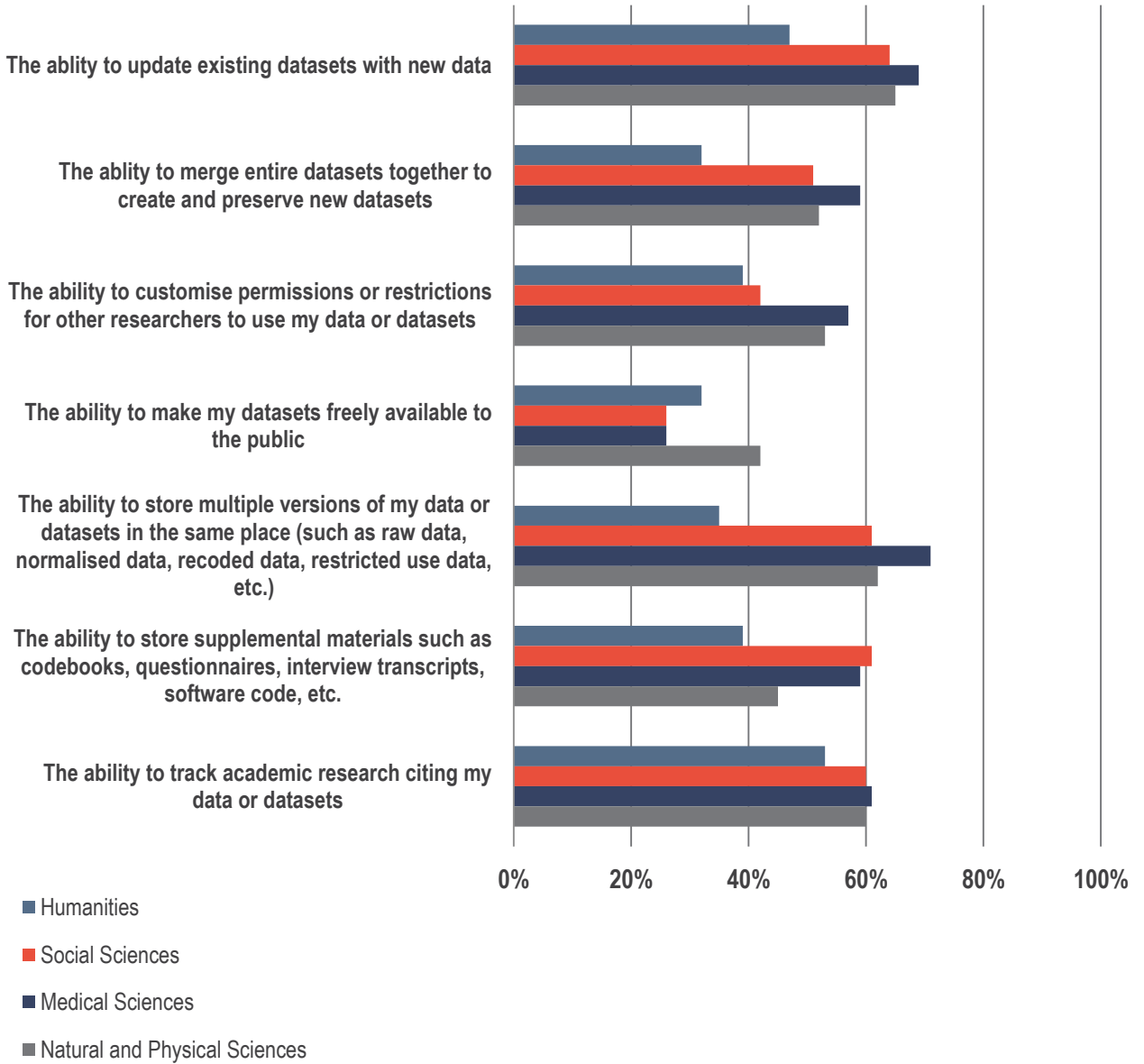
Respondents indicate that there are several features of services for managing datasets and digital media collections that are important to them. Users of both types of collections report that the ability to update existing datasets with new items and the ability to track academic research citing their data and/or images are the most valuable features. Additionally, more than half of the respondents who use digital media and

image collections indicate that the ability to store their data with corresponding published outputs (such as monographs, journal articles, etc.) is very important, and more than six out of ten of the respondents who use datasets say that they value the ability to store multiple versions of their data (such as raw data, normalized data, recoded data, etc.) in the same place. Roughly half of respondents report that the 'ability to merge entire datasets together to create and preserve new datasets' and the 'ability to customize permissions or restrictions for other users to use' the collection is very important—for datasets and media collections alike. In general, fewer humanists rank any of these features as important for either type of collection. Something more than static preservation is clearly a vital feature in many cases.

While these patterns point to a certain level of collaboration among academics when it comes to working with these collections, fewer respondents value the ability to make their data or resources free and available to the public (though a substantially larger share of natural and physical scientists indicate that this feature was important for both datasets and collections of images). This outcome resonates with other survey findings that indicate that most academics do not feel that it is very important that their research reach the general public outside of academia. While users of digital media tended, overall, to rank most features as very important less frequently than do users of other types of data, a slightly larger share of the former group indicate that the ability to make data available to the public is valuable to them. This may, in part, reflect the relative accessibility of the medium. While complex datasets may have little apparent meaning or value to the general public without narrative interpretation, digital media-- though rendered richer by contextualization and interpretation--can more easily stand on its own as a resource that is accessible to a broader audience.
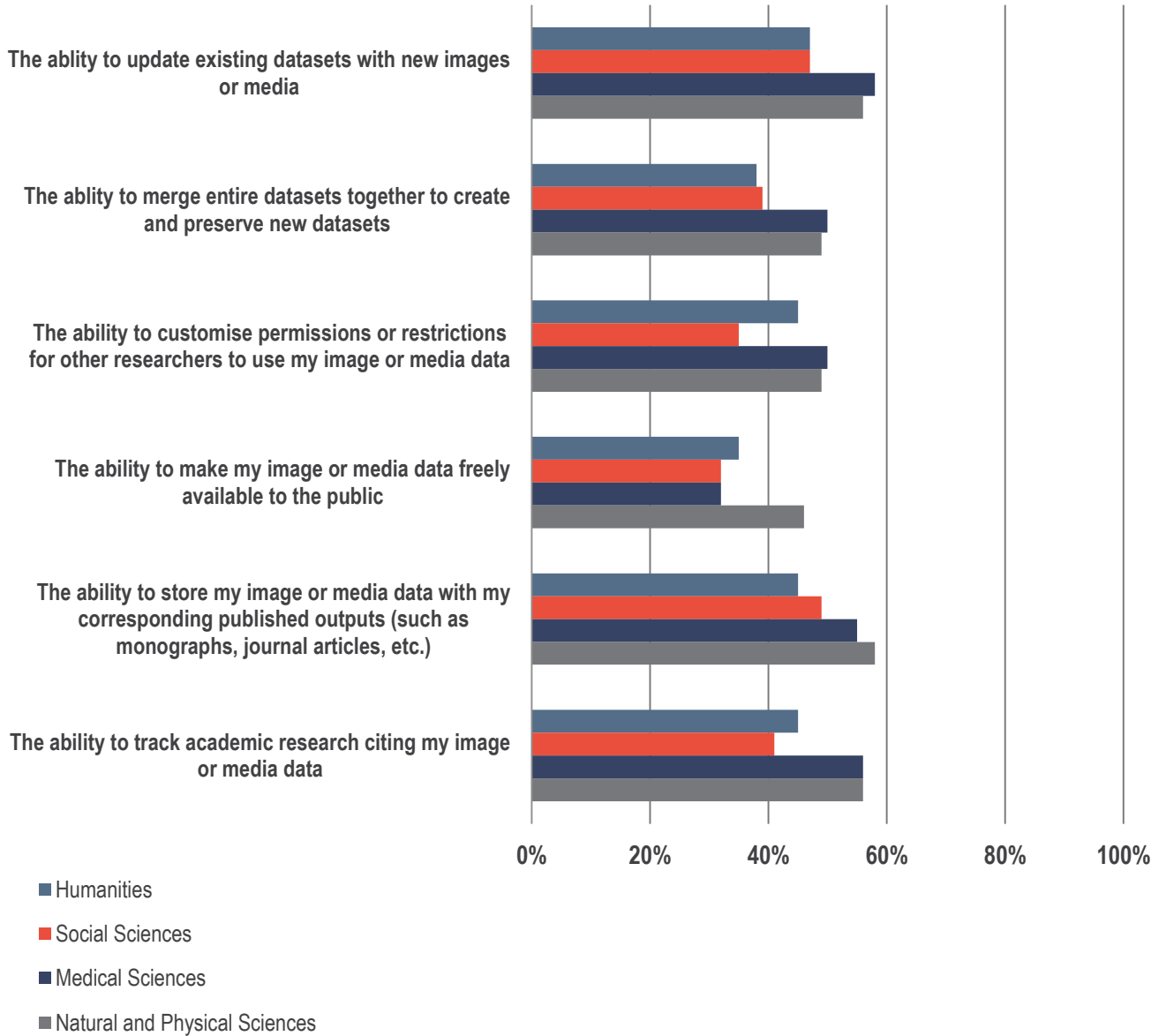
Table 42

When you think about managing or preserving the research data that you collect, how important are each of the following features or how important would each of the following features be?*

Legend:
- ■ Humanities
- ■ Social Sciences
- ■ Medical Sciences
- ■ Natural and Physical Sciences

*Percent of respondents ranking each feature as 'extremely important' (8-10 on a 10-point scale), by disciplinary grouping.

Table 43

When you think about managing or preserving the image or media data that you collect, how important are each of the following features or how important would each of the following features be?*

- ■ Humanities
- ■ Social Sciences
- ■ Medical Sciences
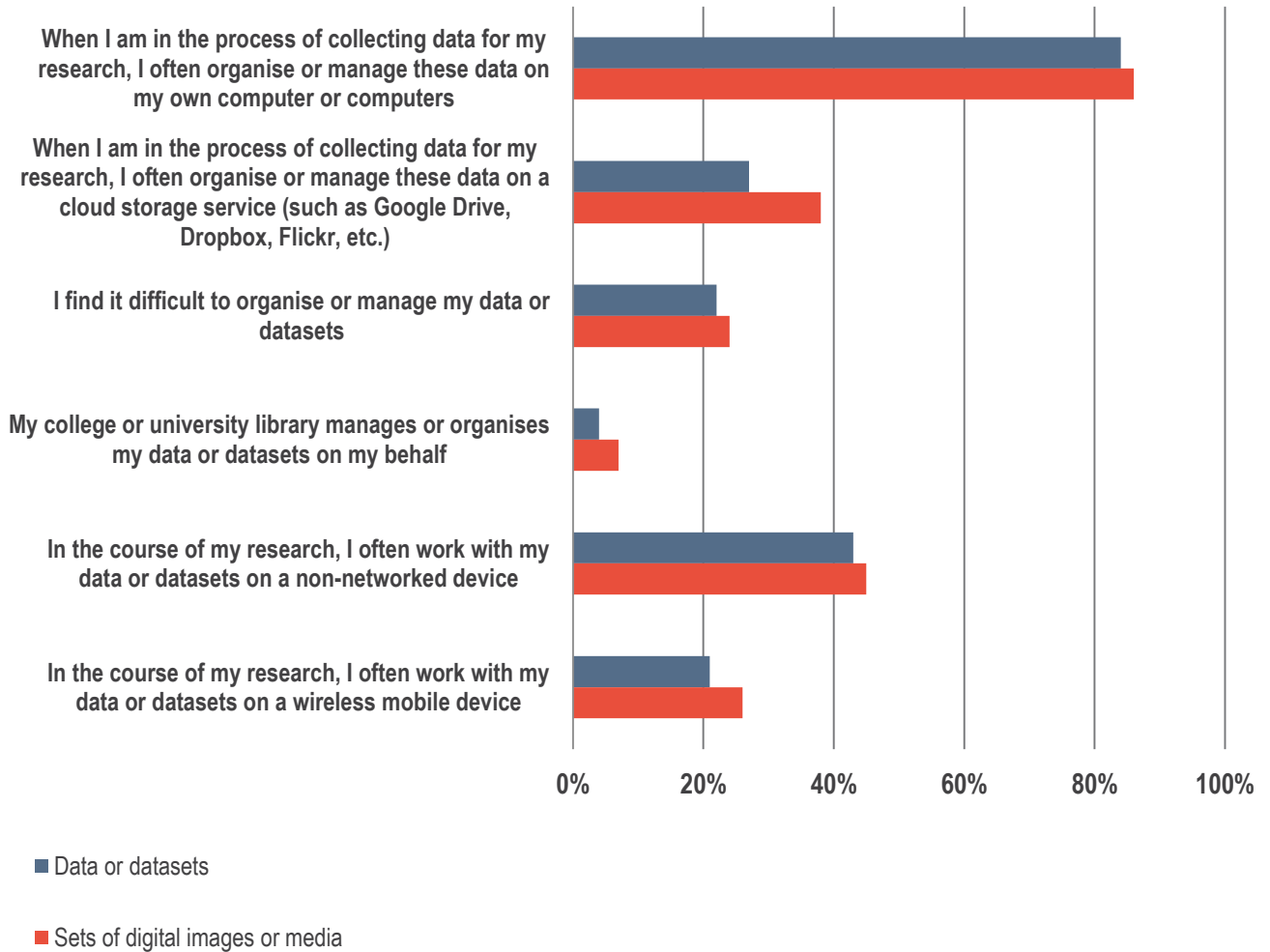- ■ Natural and Physical Sciences

*Percent of respondents ranking each feature as 'extremely important' (8-10 on a 10-point scale), by disciplinary grouping.

When academics use digital data, they have to decide not only how they will use, share, and track it, but also how they will manage their collections. Most respondents did not indicate that organizing and managing their data was a difficult endeavour for them. While one in four strongly agreed with the statement 'I find it difficult to organise or manage my data', four in ten respondents—from both groups—strongly disagreed with this assertion.

Overall, respondents reported that they relied on their own sets of tools—rather than those provided by their institutions—to manage their data. When asked how they currently organise and manage their collections of data and/or media, more than eight out of ten respondents indicate that they do so on their own computer. A slightly larger share of respondents say that they often work on non-networked devices compared with those who say they often manage their data on a cloud storage device, though the latter mode of management is favoured more by those who maintain digital media collections than by respondents who work with quantitative or qualitative datasets. Less than ten percent of respondents from each group rely on their library or university to organise and manage their datasets on their behalf, though a slightly larger share of natural and physical scientists indicate that they depend on these services than do academics from other disciplinary groupings.

Table 44

Academics' data management preferences.*

Chart categories (top to bottom):
- When I am in the process of collecting data for my research, I often organise or manage these data on my own computer or computers
- When I am in the process of collecting data for my research, I often organise or manage these data on a cloud storage service (such as Google Drive, Dropbox, Flickr, etc.)
- I find it difficult to organise or manage my data or datasets
- My college or university library manages or organises my data or datasets on my behalf
- In the course of my research, I often work with my data or datasets on a non-networked device
- In the course of my research, I often work with my data or datasets on a wireless mobile device

Legend:
■ Data or datasets
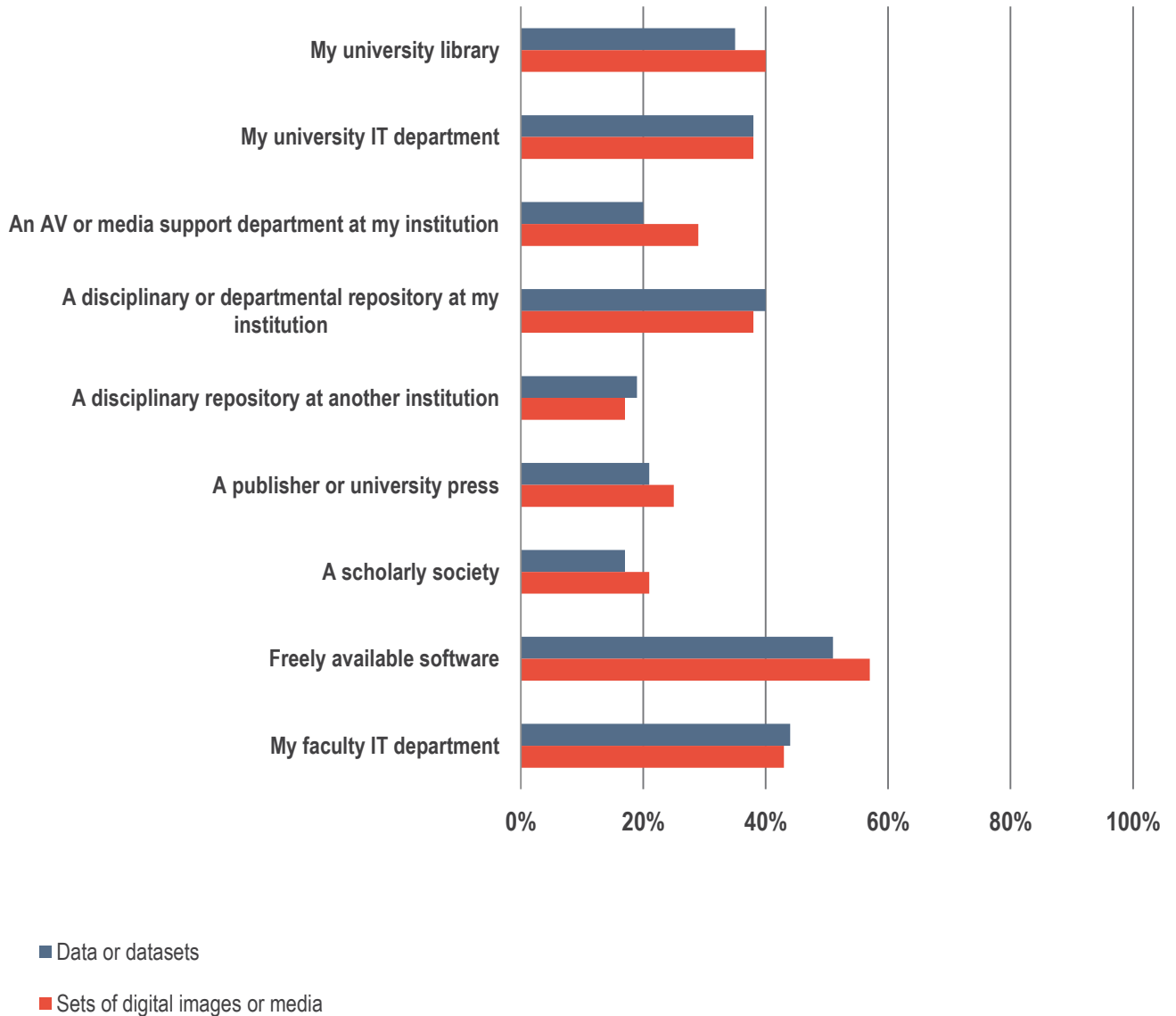■ Sets of digital images or media

*Percent of respondents agreeing strongly with each statement (8-10 on a 10-point scale), by disciplinary grouping.

When asked to rank how valuable they would find a varied set of tools and support services for managing their data, respondents—again—indicate a preference for keeping their collections as close to them—and their computers—as possible. The largest share (roughly 50%) of users of both datasets and digital media collections say that they would find freely available software very valuable for helping them to manage and preserve their datasets. One in four respondents rank on-campus infrastructure, such as 'my faculty IT department', 'my university library', 'my university IT department', or 'a disciplinary or departmental repository at my institution' a very important, though, with the exception of humanists, a slightly larger share of respondents tend to rank their faculty IT departments highly. Off campus services—such as those provided by a

scholarly society, university press or other institution—are ranked as very important by the fewest respondents.

Table 45
Please rate how valuable you would find each of the following possible sources of support for managing or preserving research data or how valuable do you find the following sources of support?

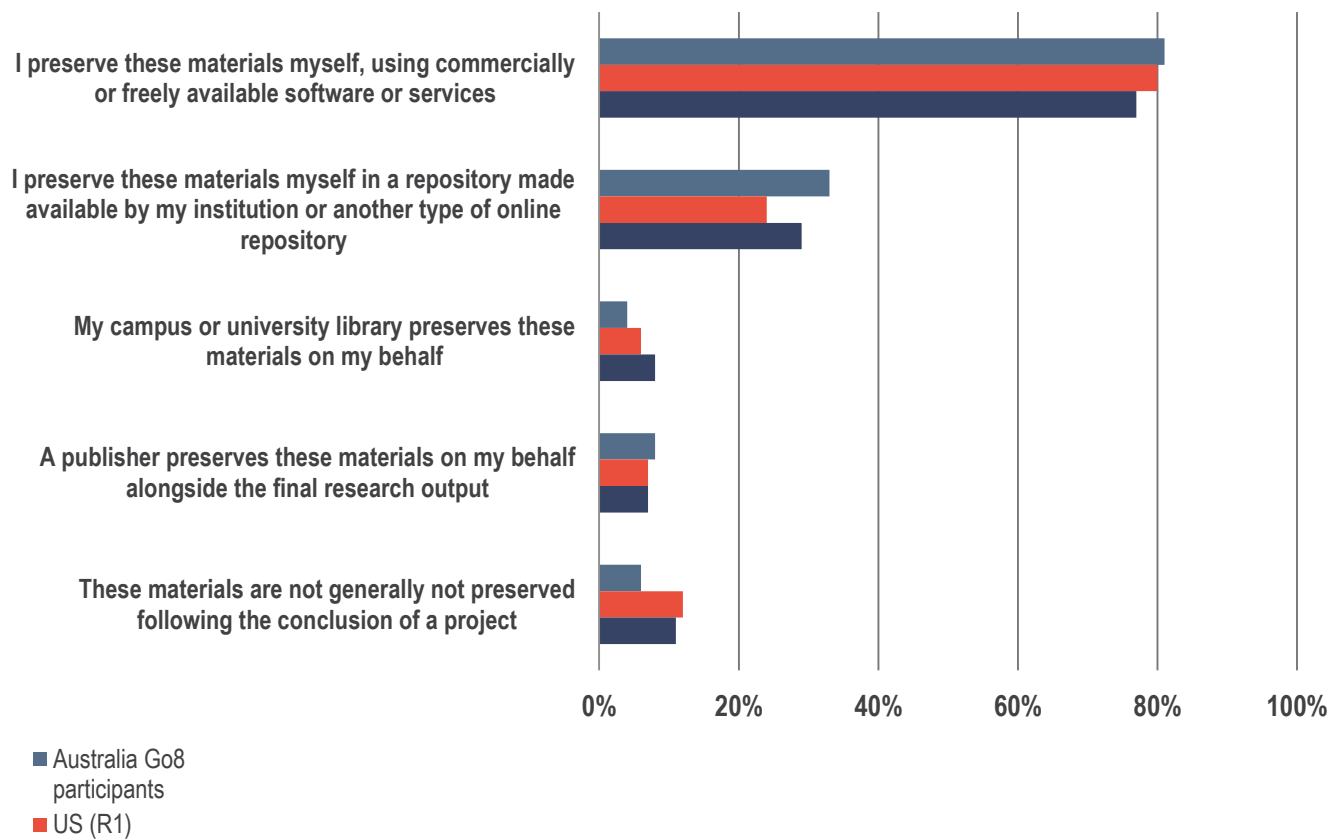

■ Data or datasets

■ Sets of digital images or media

*Percent of respondents ranking each source as 'extremely valuable' (8-10 on a 10-point scale), by data type.

Finally, respondents were asked how they preserve their data following the conclusion of projects. Like on Ithaka S+R's US and UK surveys, a substantial majority of Australian

respondents report that they preserved their data themselves, using commercially or freely available software or services. The second largest share of respondents—though substantially fewer than the previous group--say that they preserved these materials themselves, but do so in a repository made available by their institution or in another type of online repository. Academics from the humanities and social sciences are less likely to say they preserve these materials in a repository made available by their institution than are respondents from the medical sciences or physical and natural sciences.

Table 46

If these collections of research data are preserved following the conclusion of the projects, what methods are used to preserve them?*

■ Australia Go8 participants
■ US (R1)

*Percent of respondents indicating that they use each method, by country.

The smallest shares of respondents report that their university library or publisher preserves materials on their behalf. Though small shares of respondents from each discipline say that they do not preserve these materials at all, results did vary across academic fields. Among humanists, 14% say that they generally do not preserve their

materials, whereas less than 5% of academics from the medical sciences or natural and physical sciences indicate that they do not engage in preservation efforts.

Though only a small share of respondents report that they do not preserve their data following the conclusion of a project, the survey included questions—for those who do not preserve their data— about what might prevent academics from preserving their work. Of the four potential reasons available, none is ranked as very limiting by high share of the respondents. About one third of respondents indicate that they want to preserve these materials themselves, but do not have the financial support or technical skills to do so, with slightly larger shares of humanists and medical science academics agreeing strongly that these are limiting factors.

While only 10% of natural and physical scientists surveyed say they do not feel the need to preserve these materials, nearly half of the humanists surveyed indicate that they shared this point of view. Humanists' tendency to preserve data less often than academics from the natural and physical sciences could be due to the different types of data the two groups use. While scientists might collect data from novel experiments in their own labs, humanists often rely on texts or primary sources already catalogued at a library, archive or similar institution. While the collections they use might constitute unique repositories or juxtapositions of materials, the materials themselves are often already preserved elsewhere, thus mitigating the need for additional preservation.

Future Directions

The Go8 participant's implementation of the Ithaka S+R Local Survey of Academics suggests several key opportunities for innovative development:

» Though there are variations across disciplines, academics in Australia tend to place more value on the library—and particularly its service-oriented functions—than do respondents to both Ithaka S+R's US Faculty Survey 2012 and the UK Survey of Academics 2012. This finding, combined with academics' mixed perceptions regarding the shared responsibility for developing undergraduate students' research skills, demonstrates the opportunity for firming partnerships for teaching and learning between the library and academics.

» Academics' tendency to use electronic resources to discover materials suggests that libraries should continue to invest in digital tools and discovery services that help academics navigate scholarly literature and keep up with developments in their fields.

» Though very few respondents (1%) indicate that they begin their searches for scholarly materials at the library building, only a very small share indicated that they thought that institutions should divert funds away from library facilities (14%) and librarians (19%). This suggests that there may be new opportunities to define the library as a place for research and learning, and the librarian as a provider of services, and offers an important benchmark for further research.

» Discipline-level disparities in academics' use of digital methods for their research, and humanists' relatively less widespread use of these practices, may provide a fruitful field for further investigation over time, especially as more efforts are made to build digital resources and to gather datasets for a diverse range of data and media.

The benchmarks established here will be powerful indicators of academics' views over time and offer a comparative opportunity for universities across Australia and internationally.