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# How Readers Discover Content in Scholarly Journals


## Comparing the changing user behaviour between 2005 and 2012 and its impact on publisher web site design and function.

By Tracy Gardner and Simon Inger

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TRAINING FOR JOURNALS PUBLISHERS

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*Comparing the changing user behaviour between 2005 and 2012 and its impact on publisher web site design and function.*

*By Tracy Gardner and Simon Inger*

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The entire survey results data set upon which this report is based, the analytical framework, and a Kindle version of this report are available for purchase at www.renewtraining.com/publications.htm

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CABI

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IOP Publishing

Nature Publishing Group

Palgrave Macmillan

Publishing Technology

RSC Publishing

SAGE

 

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# INTRODUCTION

This report is the output of a large scale survey of journal readers (n=19064) about journal content discovery conducted during May, June and July of 2102. While statistics and analytics can tell us some of this information, there are many gaps in the knowledge that these can provide which we have endeavoured to fill by asking readers what how they discover journal content.

The diagram below shows some of the paths open to a selection of reader types in discovering journal content online, and demonstrates the complexity of reader navigation. Libraries in particular provide two layers of navigation, although these layers are increasingly indistinguishable to the reader. Library web pages are a discovery tool in their own right and range from simple catalogue listings of titles right through to advanced "web-scale" discovery solutions. In addition, though, there is the library link server (or link resolver), which is often configured to intermediate traffic from many other discovery resources and route the reader through to the most appropriate incarnation of the content (usually the subscribed-to incarnation) for the reader. For more advanced libraries, this can be remarkably powerful, intermediating traffic not only from library web pages and A&Is, but also from mainstream search engines, a feat sometimes achieved through careful programming of the institutional proxy or gateway.

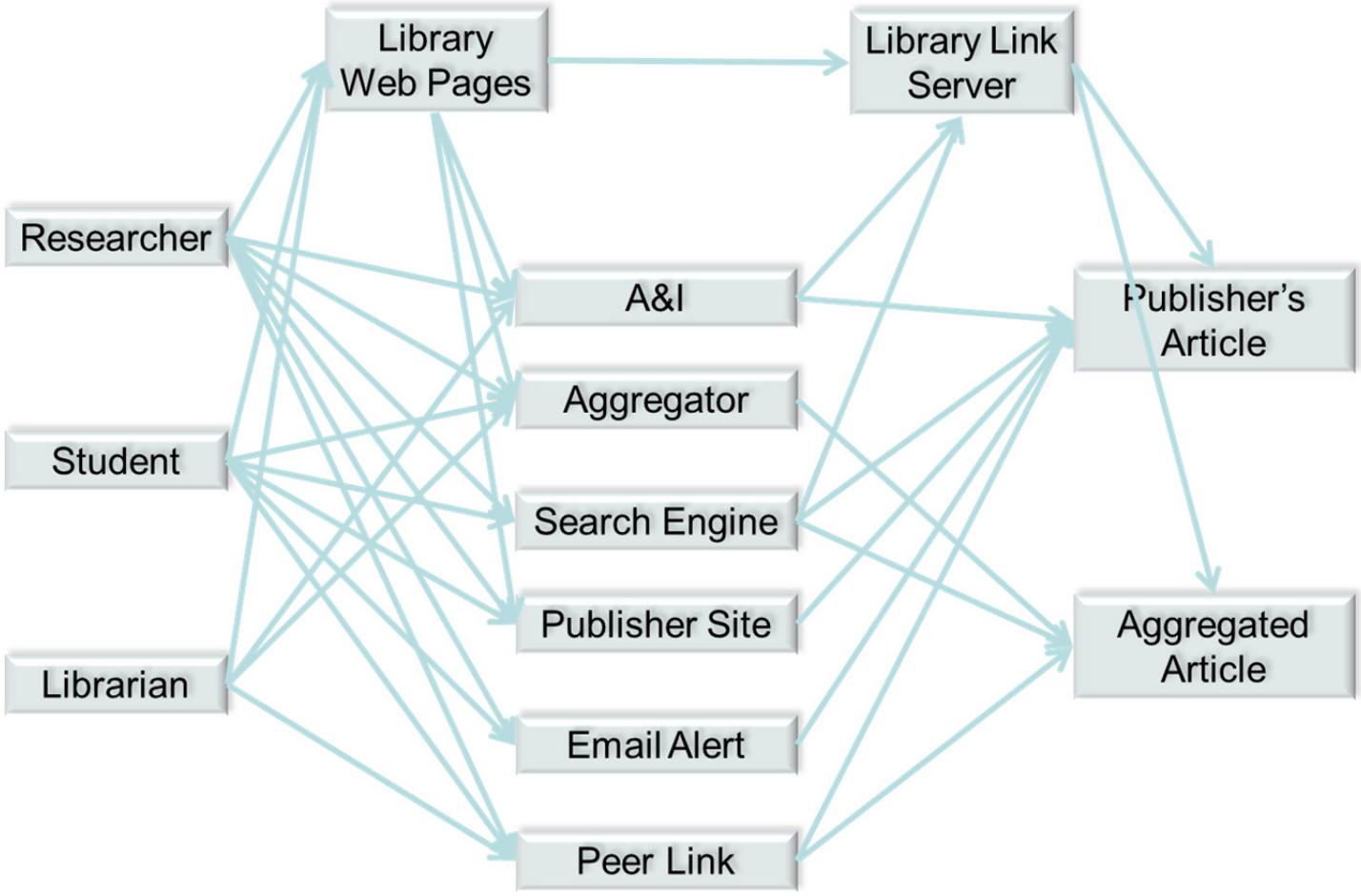


***Figure 1 – Some of the paths in reader navigation and discovery***

Usage statistics and web analytics can reveal some of this navigation. From the publisher's point of view, it will know how much use was made of its own content by each institution, but most likely not know the reader demographic within that institution e.g. job role. The publisher will also know something of which of the discovery platforms the reader has arrived from, and also the institutional breakdown of usage of any aggregated databases. Currently, the publisher uses this limited knowledge to help show value to its clients and also to inform the design of its web site. Given the needs of its paying clients (the libraries), publishers need to know more about this navigational behaviour.

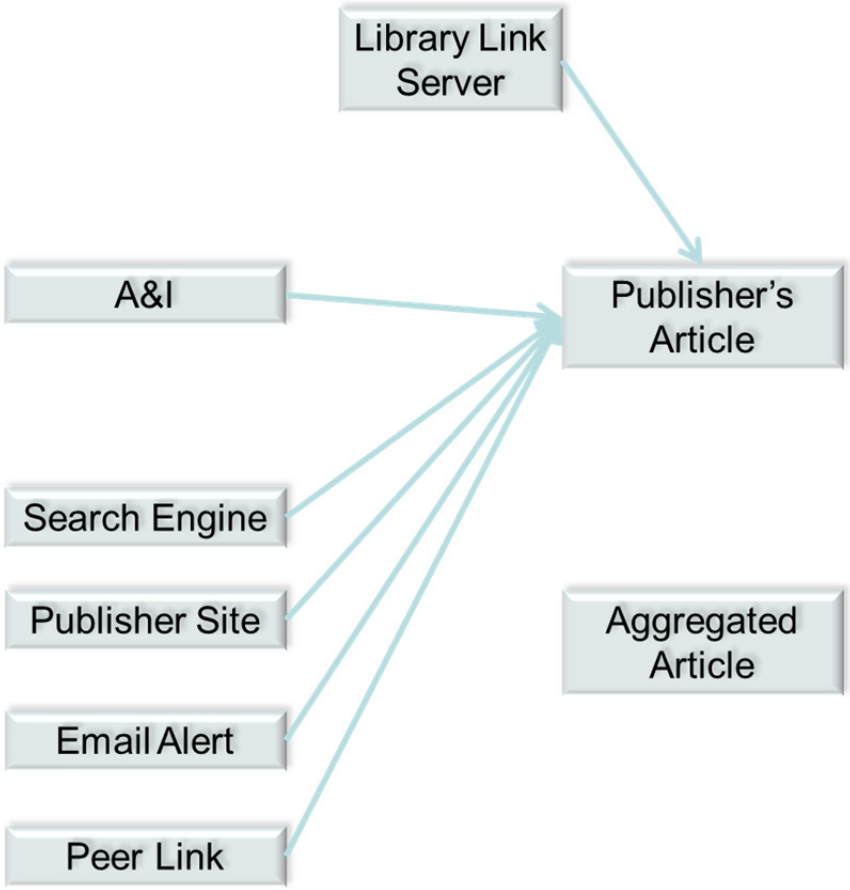


***Figure 2 – What the publisher can potentially measure***

The library knows more of the individual's identity, and has the potential to know a lot about discovery platforms as long as the reader navigates to the content via a link resolver, but the library doesn't know about the complexities of navigation for those who operate outside of the library-intermediated environment; however, the library will get usage data from publishers, but this is not married up with a reader profile. There is an increasing need for libraries to be able to demonstrate value of e-resources. In its simplest form this is usage, but more advanced analysis relies on understanding which job roles were responsible for each type of usage, and in the final analysis, libraries need to be able to show evidence of a positive outcome in return for acquisition of information products.

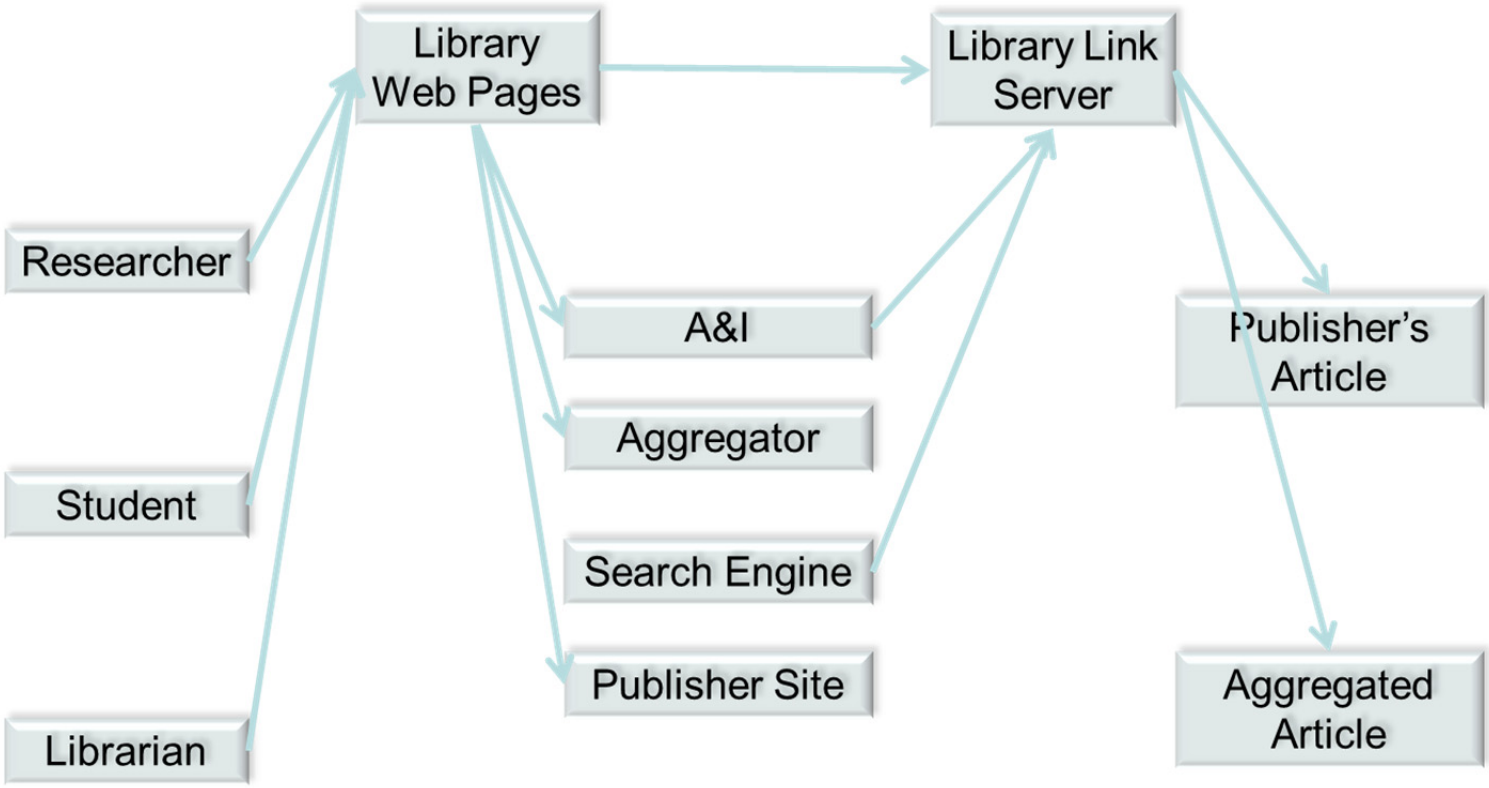


***Figure 3 – What the library can potentially measure***

This research aims to fill some of these knowledge gaps by surveying what readers believe are their actions in discovery.

This research follows on from earlier studies performed in 2005 by Scholarly Information Strategies (for whom the authors were consultants) and 2008 (Inger and Gardner) that actually asks researchers about their preferred starting points for research, now more commonly referred to as "discovery resources". The subtle shifts over time in reader preferences provide a valuable insight into reader navigation, the features that they find useful in publisher web sites, and the role and effectiveness of library technologies.

Our previous reports showed that readers are more likely to arrive within a journal web site at the article or abstract level than anywhere else and since then publishers have responded by changing their web sites so that more of the features and functions are visible from that landing page.

The most highly sought-after features of journal web sites are still ToC alerts and search, but not uniformly from region to region, from subject to subject, or from job-role to job-role. These findings shed light on how publishers should engineer their web sites to meet their readers' navigational behaviour.

# METHODOLOGY

This research carries on from, and expands upon, previous research undertaken in 2005 and 2008 (also by Simon Inger and Tracy Gardner) and attempts to follow the trends in behaviour over that period of time. Naturally, each time the survey is repeated, the authors have sought to keep the questions as consistent as possible with the questions in earlier surveys whilst keeping terminology current and tracking new developments. For this reason the three key questions on reader behaviour were modified a little, some options being reclassified and additional options created. However, since those questions don't limit how many starting points the reader acknowledges as being important, this approach should have minimal impact on the results for any option present in the survey all the way from 2005 to 2012. Other questions were dropped completely, since the conclusions from these in 2008 are now so widely accepted as fact (and easily checked with analytics) that these were not tested. These included asking readers where links from discovery products would take them in publisher web sites, the answer being predominantly at the article level.

One of the key limitations of the older surveys was their reach. This time around we sought to gain the responses of 40 times as many people so that meaningful demographic breakdowns were possible, by region, by subject, by major countries, by World Bank income classifications. Our primary goal was to give us sufficient responses within each subject category to make for meaningful comparisons, so we charted the subject areas we needed for our study and created a list of publishers and intermediaries who had content in those subject areas and approached them over a period of six months until we had sufficient organisations as supporters to give us the best chance of reaching the numbers we needed.

Of course, since the invitations to take the survey were sent out by many publishers, some individuals will have been invited to take the survey more than once. At no point did we have any sight of any email addresses from any of the supporting organisations and so no de-duplication was possible. However, we attempted to mitigate the effects of individuals taking the survey more than once by careful wording in the survey invitation – the standard invitation pointed out that if the respondent had received the

survey invitation more than once, it was not intended as a prompt to take the survey twice, nor an indication that any previous response had not been received. In addition, the survey was incentivised, with three prizes of $100 Amazon vouchers or equivalent, but it was made clear that duplicate prize draw entries would be ignored.

## Sample

For the reasons outlined above the sample used for the survey was not a random sample – surveyees were selected by our supporters who themselves were selected by their likely subject coverage. In addition, the contacts that each publisher used for the survey will be quite highly engaged with the publisher or intermediary – all of the contacts used will have *opted-in* to receiving emails of this type. Although the organisations chosen were predominantly UK-based, their clientele are truly global, and the regional demographic breakdowns are testament to this.

## Survey Design and Response Rate

To ensure the highest response rate the survey was limited in size. We timed the survey to take about 9 minutes and we advertised it as such. Of the 19064 people who took the survey, 16616 of them completed it (87.2%).

Each survey partner used a different wording and sometimes method and medium to reach potential surveyees and used various samples of their contact databases. As such, response rates are not directly comparable. However, the response rates ranged from 1.7% to 6.4%, with most being between 2.5% and 3.0%.

## Bias and Limitations

Of course any survey is limited in what it can achieve. We tried not to be leading in our questioning but there are always limitations in the language used. In addition, although the audience was international, the survey was only conducted in English and so the interpretation of the language may be a factor in the accuracy of the responses. However, it should be noted that the surveyees do all consume journal articles in English.

The survey used invitations from our supporters, which were not necessarily a completely representative sample of the world of journal readers. Furthermore, due to data privacy/data protection rules, all those invited to the survey via email will be quite highly engaged with the publisher and have *opted-in* to receiving emails like these. This may bias their attitude to publisher web site features, or indeed their likelihood of having bookmarked a particular journal page. It may be, therefore, that external discovery platforms are even more important than portrayed in these results.

No control sample was used in this survey. With so many variables, of subject, region, job role and sector, it was decided that creating a control sample would be beyond the scope of this research project.

## TERMINOLOGY

Since this year's survey set out to test subject differences between the main observations, the survey was built to ask for the user's subject area and then branch the survey to fifteen different incarnations of the first four main questions. This allowed us to use relevant examples for A&Is, aggregations, etc., that made sense for each subject area which should have improved the response accuracy from previous years. This may, of course, mean that the comparisons with previous years become harder to make, insofar as the 2008 and 2005 data are likely to be less accurate. The full set of questions is attached as an appendix to this document (PDF version only). The appendix is also available at www.renewtraining.com.

## ANALYSIS

Analysis was performed using Excel. Many of the results were reduced to binary arrays to make further comparisons easy to calculate. A tool was developed so that a number of comparisons could be made for each survey question easily. The chart below shows how the tool works, creating 3 series of data, each as a result of comparing two (or fewer) demographics (there is an "All Records" demographic as well).

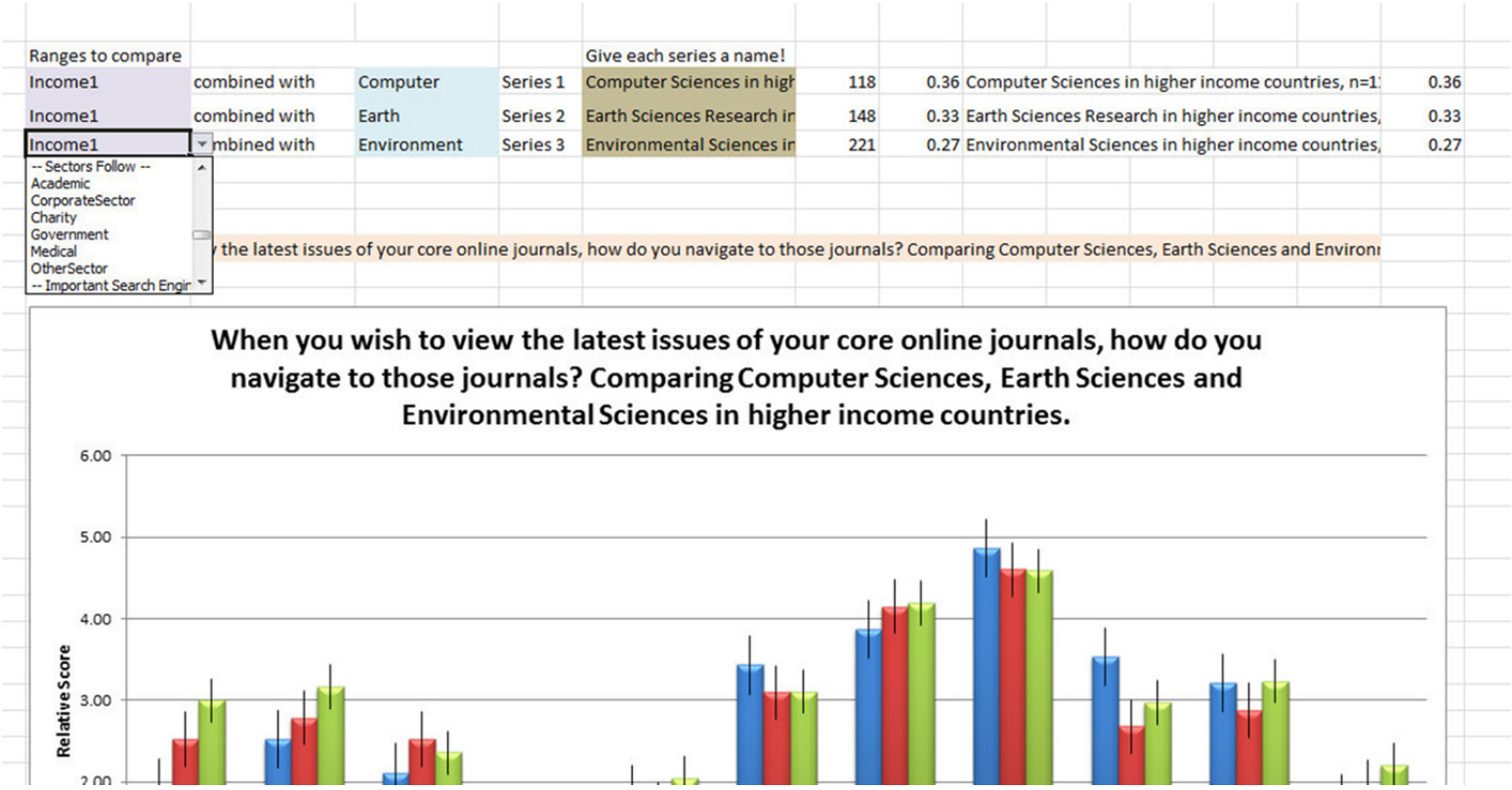


*Figure 4 – a screenshot of the Excel tool created*

## Error Calculations

Throughout this document we have tried to keep demographic breakdowns of the data to quite large samples so as to minimise errors. All the charts include error bars calculated at a 95% confidence interval, which of course in itself brings assumptions about the nature of the distribution of answers. The reader should be aware that with average luck, one in twenty of these calculations will be insufficient and the true reading will be out of the boundaries shown in the charts. They may not be far further adrift, but as with all survey results, the reader needs to exercise caution in interpreting any certainty in the outcomes shown.

For simplicity, the error bars shown for a given data series are the same. For example, if one measurement representing 30% of the responses carried with it an error of ±5%, and another measurement of 20% of the responses carried with it an error of ±4%, the chart would be plotted with both errors at ±4.5%. Therefore, some of the error bars for "popular" results will be slightly understated. In reality, the plots in this report generally carry much smaller error ranges than in this example, and the differences between them would therefore be much smaller still.

In some of the charts, with multiple breakdowns of the data, the error bars shown are those for the series being analysed with the fewest responses. This means that the errors for the remaining breakdowns are overstated. The reader should make a mental note of the response numbers 'n' clearly shown in each chart in making a judgement about the accuracy of the data. In these charts the actual error bars will be smaller than those shown for the great majority of the data points – a very cautious view of error has been used in these charts.

## COMPARISON WITH 2005 AND 2008

The survey, as conducted in 2008, was formed as similarly as possible to the original survey conducted in 2005. In both cases an invitation to take the survey was emailed to a large selection of readers of the supporters of each of those items of research. As already noted, it was imperative that the survey used language and terms as similar as possible to the prior research, that the medium of collection was the same (online survey) and the temptation to add greatly to the survey was resisted.

In 2005 and 2008, invitees to the survey were taken solely from those who had signed up for ToC alerts. It was noted in those surveys that this potentially affected the popularity of ToC alerts as a starting point in the findings. This year, this bias is somewhat removed (although the exact extent we cannot know), and this seems to be apparent in some of the results.

Between 2005 and 2008, there was a shift in response demographic towards Life Scientists in North America, away from other demographics. In making those comparisons these shifts were taken into account. In comparing the data with the 2012 data we have created a random sampling of the respondents to the 2012 data down to the 2008 levels. This random sampling included a probability calculation which created broadly the same demographic breakdown in the 2012 "down-sampled" set as in the 2008 set. For example, approximately 1 in 300 of the responses of those in Humanities were used, and 40% of them would be in North America. Overall the method seems to have created a set of data with similar demographics as the 2008 set, but not identical (of course).

The trend information is not available for all of the questions asked in this survey, because a number of them are new for 2012, and some of the discovery platform options were introduced for the first time in 2012 also (such as Mendeley). Also some of the questions asked in 2005 and 2008 are now considered redundant – the practices that they recommended are now part of received wisdom.

# DEMOGRAPHICS

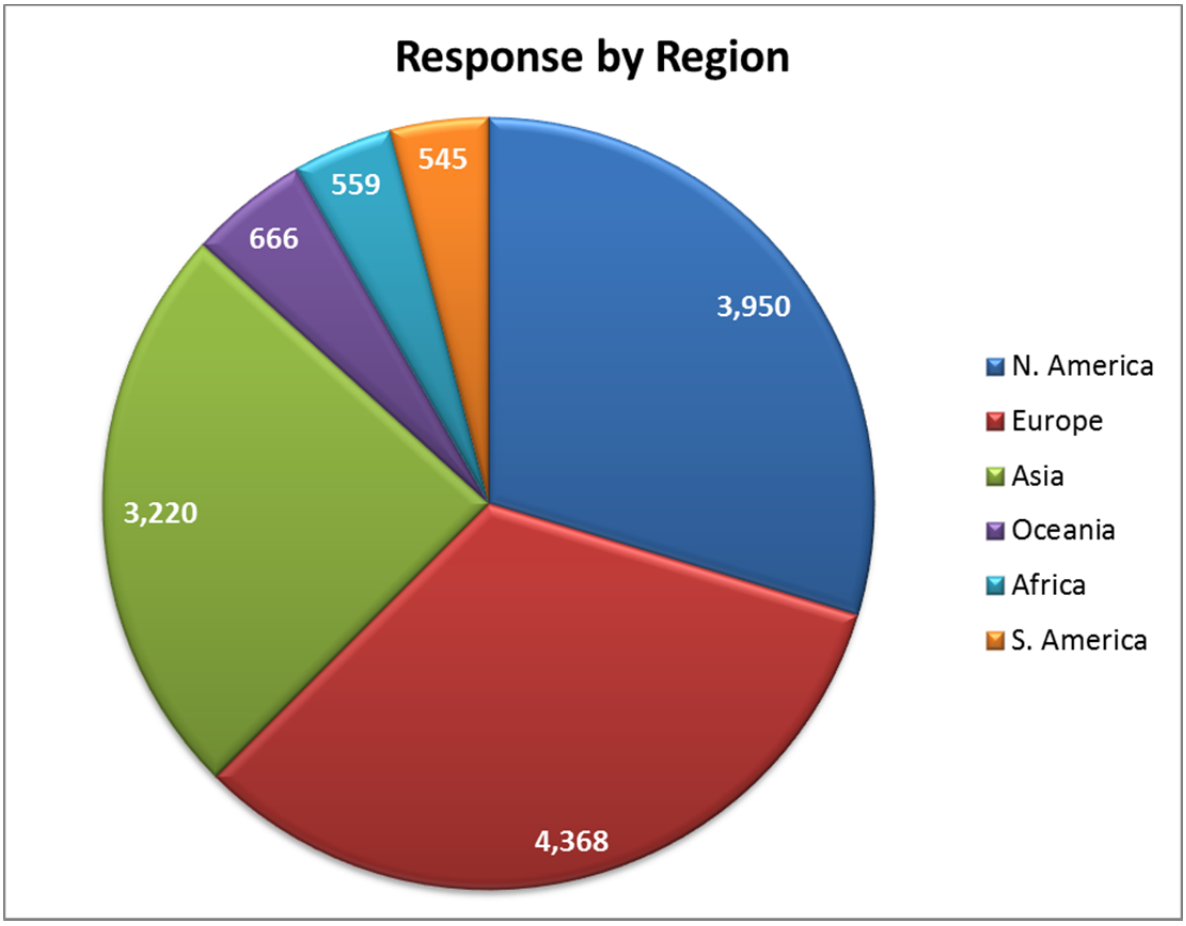


*Figure 5*

As shown in Figure 5, the respondents to the survey come from an excellent regional spread and this allows for significant regional (and in some cases country) breakdowns, see below. 13308 people told us their country (and hence region).

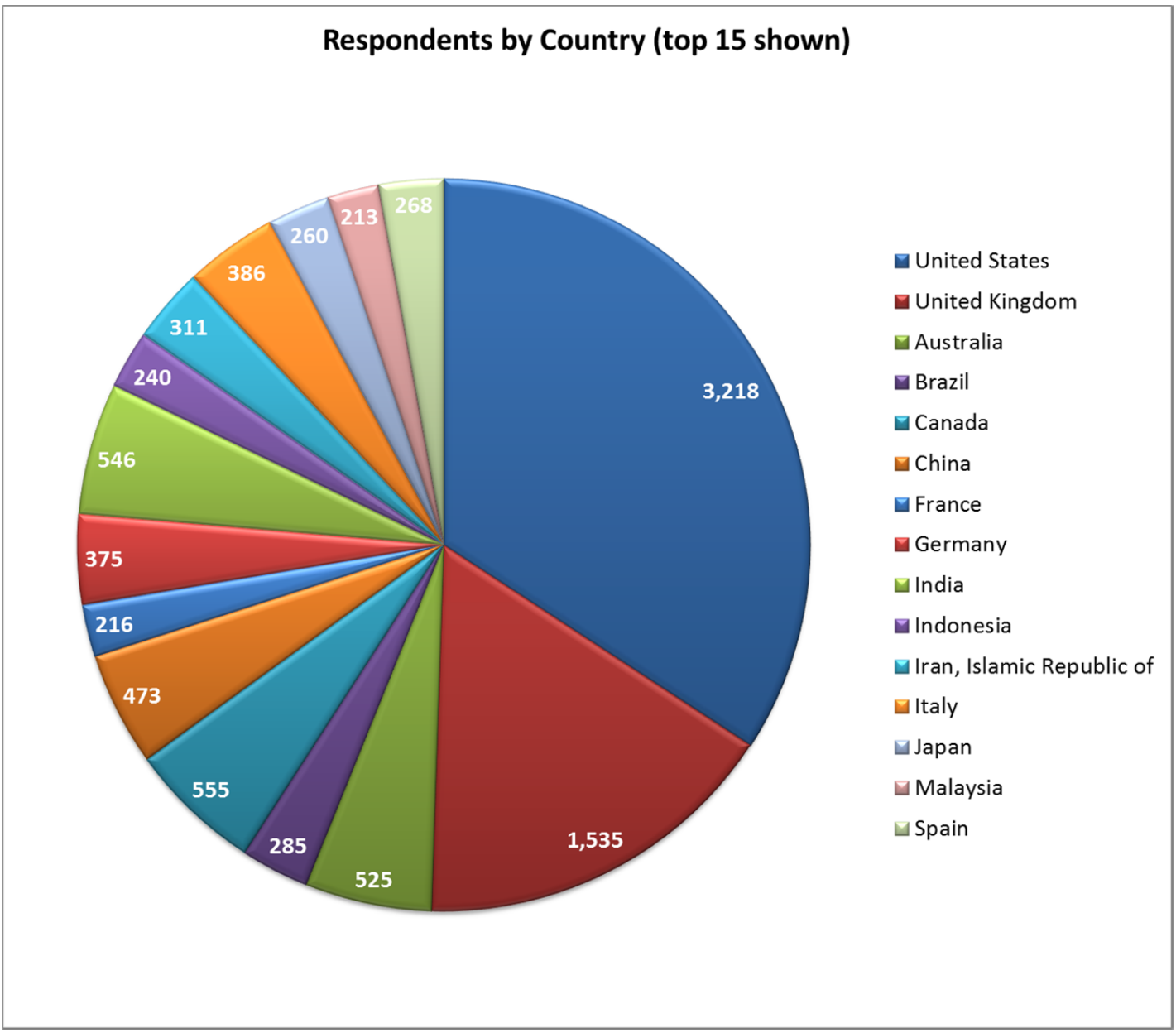


***Figure 6***

9406 people came from the top 15 countries shown above, i.e. 71% of those who indicated a country.

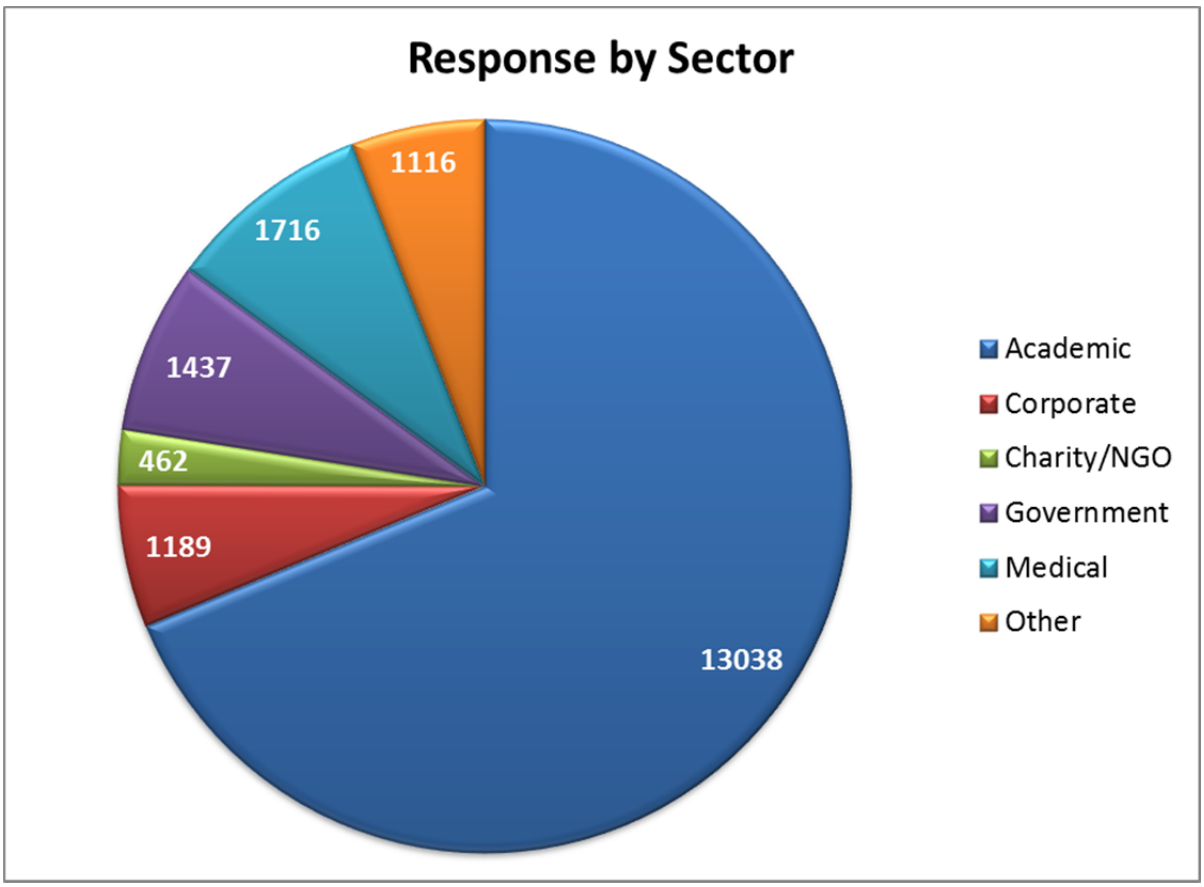


*Figure 7*

The sector-breakdown is also very good, with sufficient numbers in all but Charity/NGO to allow for further breakdowns by subject, region, income and so on. 18958 people told us which sector they worked in.

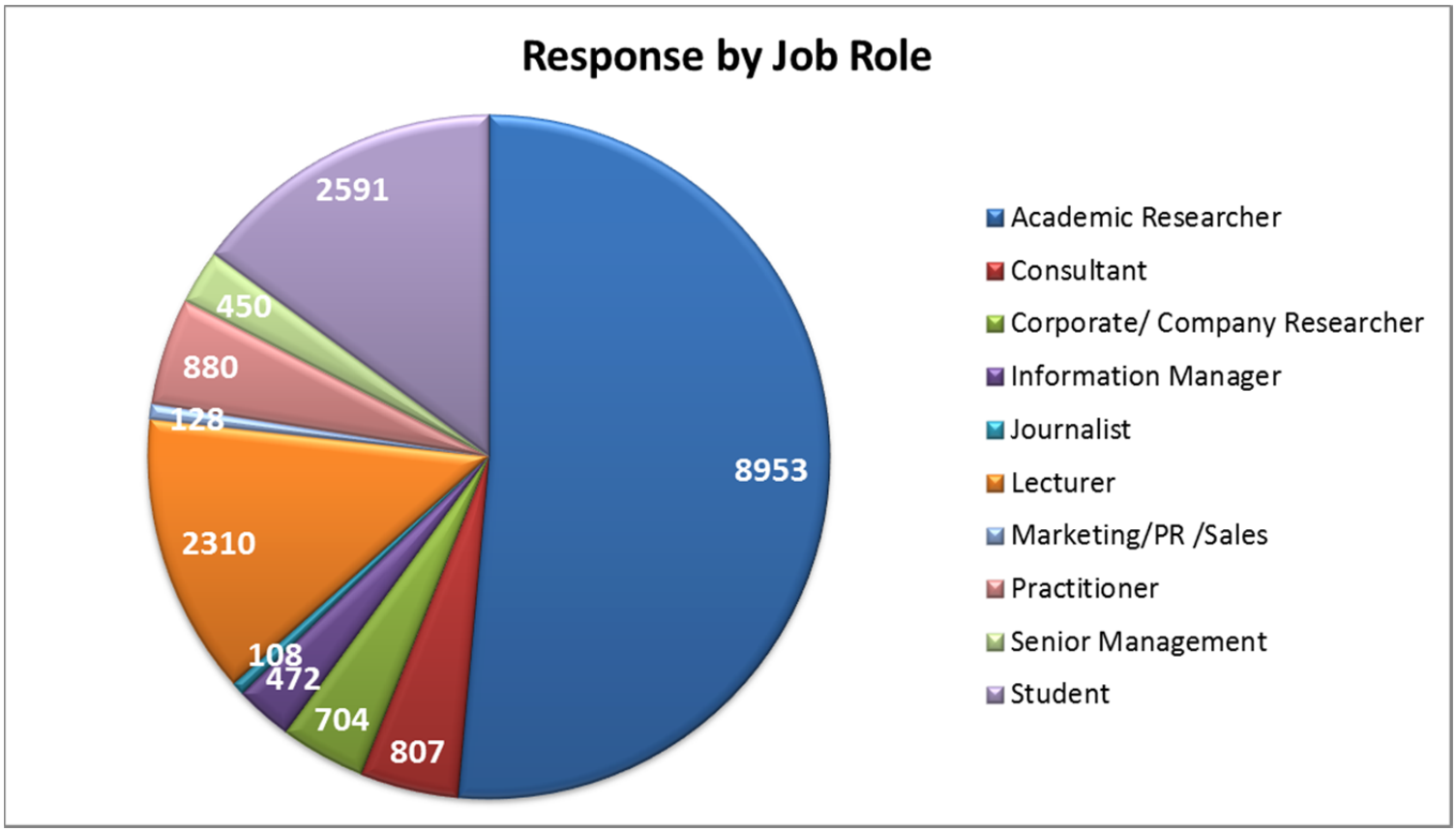


***Figure 8***

The numbers of respondents by job role allows for meaningful comparisons to be made for all roles save for, perhaps, journalists and marketing/PR/sales roles. There are sufficient responses within academic researcher, lecturer and student categories to allow for considerable further demographic analysis within these groups, including by subject, region and income. 17403 people told us their job role.

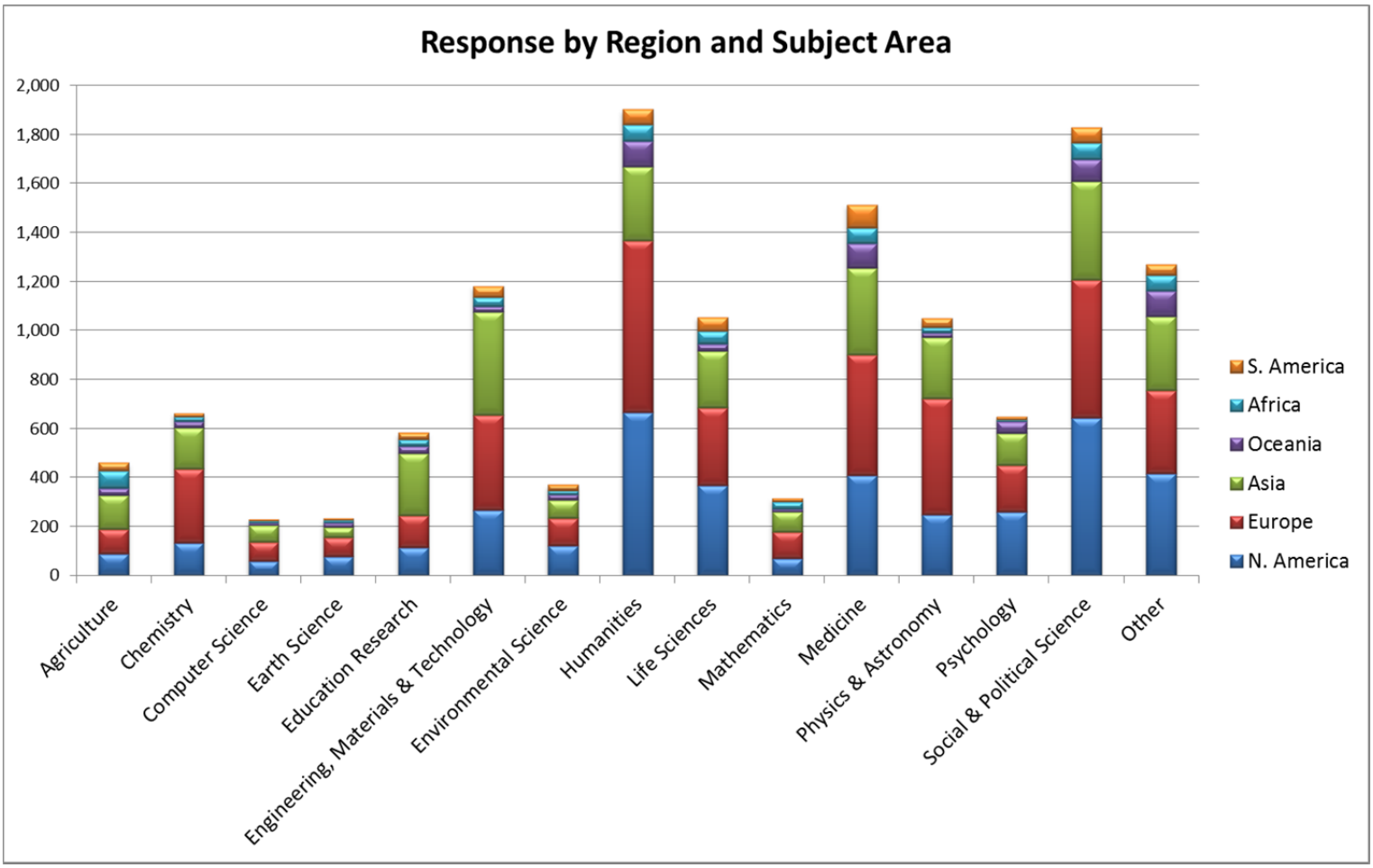


***Figure 9***

When embarking on this project, our aim was to get around 1000 responses in each subject area, so that detailed demographic analysis would be possible within subject with minimal error-bars. This was achieved for six of the subject areas, and three more subject areas got around 600 responses, which still allows for some useful further sub-division. Computer Science, Earth Science, Environmental Science and Mathematics are the least well-represented in the data, although in absolute terms there are enough individuals in these areas to allow for a useful subject-based analysis, even if not when combined with a further demographic.

Within these subject areas we have achieved a useful regional split, although we do not have any corroborating evidence to show whether or not these are in any way in proportion to the numbers of individuals in each subject area in each of the regions. The relative response by region within a given subject is shown better in the chart below. While it may not be surprising that an enlarged proportion of those in Agriculture were from

Africa, the authors were a little surprised by the proportion of individuals in Education Research that come from Asia.

17289 people told us their subject area and a further 1761 people stated "Other". This question was mandatory in the survey because it controlled branching to the behaviour questions which included subject-relevant examples of starting points/discovery resources.

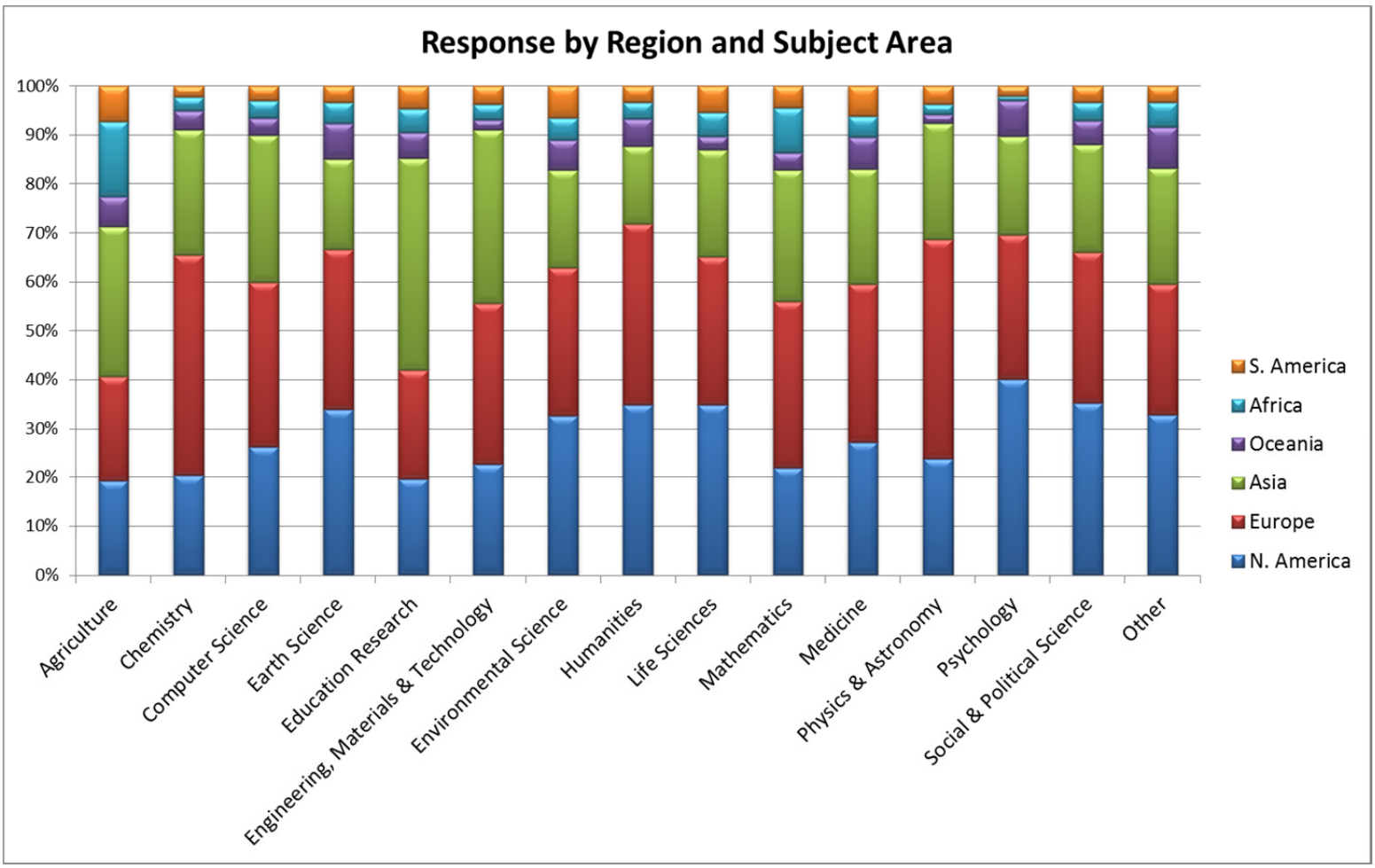


***Figure 10***

In analysing the results, these splits affect a number of the headline "*all-records*" results, but has diminishing effect on other demographic analyses.

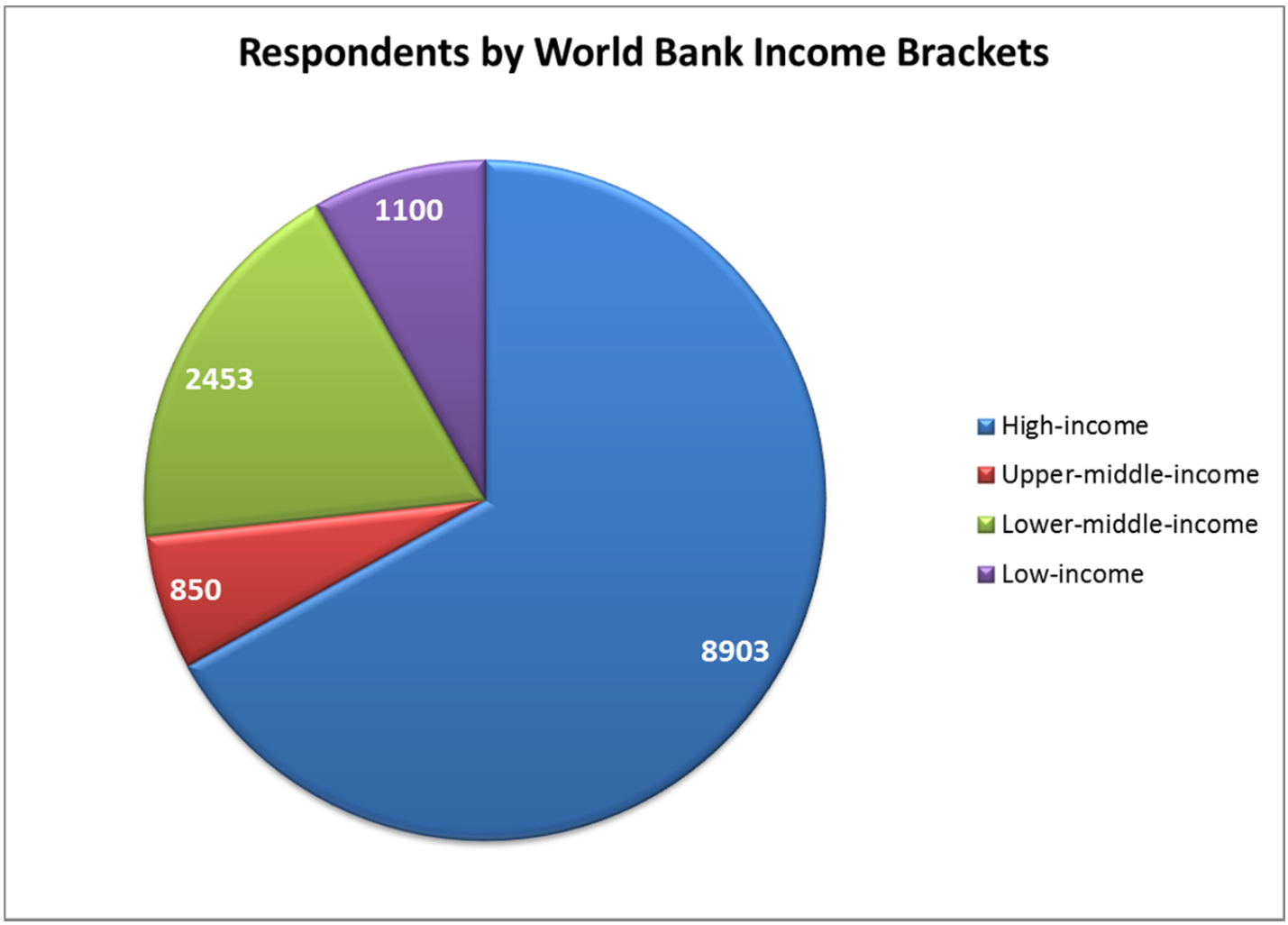


*Figure 11*

The individuals' countries were mapped onto World Bank income categories which are themselves calculated as GNI per capita: low income, $1,025 or less; lower middle income, $1,026 - $4,035; upper middle income, $4,036 - $12,475; and high income, $12,476 or more, as measured in 2011.

# DISCOVERY RESOURCE CHARACTERISTICS

Readers have a wide choice of where to undertake content discovery, so it is worthwhile considering the characteristics of each starting point, or discovery platform, here.

## ABSTRACTING AND INDEXING SERVICES (SPECIALIST BIBLIOGRAPHIC DATABASES)

The dominant subject A&Is – e.g. Scopus, PubMed, Web of Science, focus on structured access to the highest quality information within a discipline. They typically cover all the key literature but not necessarily all the literature in a discipline. Their utility flows from the one-stop-shop nature of the service that they offer and the perceived certainty and reassurance that they offer to users in providing the authoritative source of search results within a discipline. However, they cannot boast universal coverage of the literature – they provide good coverage of a defined subject niche, but reduce the serendipitous discovery of peripheral material. Also, many A&Is are sold at a premium, which in itself is a barrier to their use. A&Is typically link to publisher sites at the article level, so readers using these starting points in their activities will experience publisher web sites from the "article up" rather than the "home page down".

## LIBRARY WEB WAGES (PREVIOUSLY LIBRARY OPAC)

The library's own web pages, having suffered initially from the growth of general purpose search engines are once more of importance as the starting point to navigation. Library controlled web space has the advantage of linking only to content that has been paid for by the library and meets library selection criteria. The library's deployment of link resolver technology has further strengthened their importance. Not only are libraries now the primary purchasers of content for their staff, researchers and students, they are also, where link resolver and associated technology has been deployed, the main determinants of how different, relevant resources are presented and offered to end users; the way in which the user navigates to a publisher site; and also what part of the site the user is delivered to. Most of the library technology layers being deployed offer "deep-linking" direct to the article level within a journal web-site, very much affecting publisher web-site

design. Investment in web-scale discovery technologies further underline the intent that libraries have to stay firmly embedded in discovery. Library web pages will link to the publisher web site at the publisher, title or article level depending on which component of the technology suite is being used. Web scale discovery will take the reader directly to the article level within the publisher site.

### A SPECIALIST WEB SITE FOR YOUR SUBJECT AREA (DROPPED FROM THIS SURVEY)

Specialist web sites tend to serve highly specific subject niches. They are effectively highly selective content sites and may also contain a high degree of editorial recommendations for content, providing a very useful short-cut for readers wishing to save time when reviewing the literature. Some portals have content licensed to them, which also means that in those cases portal subscribers do not have to worry about further access barriers as they navigate to the content within the portals. Although dropped from this survey for reasons of nomenclature, it may be considered somewhat akin to a community web site, discussed below.

### A JOURNAL COLLECTION, OR AGGREGATION (NEW IN THIS SURVEY)

This survey has chosen to study the importance of aggregators in journal discovery for the first time, though recognising that this may be a closed environment – discovery in such a database can lead only to content in that database. Aggregated databases are normally a separate incarnation of a collection of journal content licensed to an aggregator and sold and delivered independently to a publisher's primary content incarnation.

### A COMMUNITY WEB SITE (NEW IN THIS SURVEY)

There are a growing number of community web sites in place today - Mendeley, BioMedExperts, UniPhy, Redcat and others. While their primary function may be professional networking, they also allow for content discovery by allowing individuals to record or post the content they like and allow others to follow up on the content so posted. This survey tests their usefulness in this context. Readers following links from community web sites are most likely to land at the article level within a publisher's web site.

### Web pages managed by a key research group

There appear to be a number of informally-produced web sites run by research groups around the world who record details of articles that they or their peers have created, and sometimes these include some form of recommended reading, even if only by merit of these articles being noted on these pages. Some of these pages have also disappeared during the past few years and have sometimes reappeared within Facebook instead. Their popularity, however, remains. Readers following links from research group web pages are most likely to land at the article level within a publisher's web site.

### A departmental listing of electronic journals (dropped from this survey)

A departmental listing of resources, like a library listing, usually provides a list of subscribed resources for the user, as well as a subject focused listing, making both navigation and access to the content easier for the reader.

### A publisher's web site

Publisher web sites, of course, contain only a fraction of the available literature in a given subject area, unless that publisher has almost complete dominance of the subject area under consideration. Despite this obvious limitation when searching for new content, the size of these publisher collections and the often superior interface design make these sites appealing to users, even though information specialists would advise against using them in lieu of larger search collections.

### Email based alerts

Email based alerts are a valuable starting point for users in several modes. The obvious advantage of them is that they are under user control, and most likely are set up for content that the user knows he has access rights to use. By definition, the resource has already gained the user's trust. Alerts will take the reader to the journal article predominantly, but may also lead the reader to the ToC (i.e. the issue level) on the publisher web site.

### THE JOURNAL'S HOMEPAGE

In many ways, the journal's home page is not dissimilar in characteristics to email based alerts. A user has bookmarked a journal home page presumably because he has experience of the journal, has access to it (a subscriber) and has respect and trust for it.

### A JOURNALS GATEWAY (DROPPED FROM THIS SURVEY)

The distinction between journals gateways and other discovery channels, such as library web pages and even aggregators, has blurred since 2008. As such this class of organisation is no longer tested in this survey.

### GENERAL WEB SEARCH ENGINES

The main strengths of search engines such as Google are their simplicity, broad coverage and the fact they are free to use. Their speed allows for search to be refined and retried quickly and is a frequently cited reason for their popularity. Search engines will predominantly lead the reader to an article (if that was the nature of the search) or to journal home pages or publisher site home pages as appropriate.

### ACADEMIC SEARCH ENGINES (NEW FOR THIS SURVEY)

In previous studies we did not separate out the use of the likes of Google Scholar from Google. But with the advent of additional players in this space, e.g. Microsoft Academic Search, we have included this as a separate entity this time. These search engines achieve some measure of quality by selection and the addition of citations to results is a clear differentiator over the general search engine. Academic search engines will predominantly lead the reader to an article within the publisher web site, rather than higher up in the web site hierarchy.

### A SCHOLARLY SOCIETY WEB PAGE

Society web pages have much the same appeal as a journal homepage. Society members usually have access privileges to the society journals through the site. One presumes, though, that the brand affinity for members with the society is even stronger than with the journal.

# DISCOVERY RESOURCE PREFERENCE

In designing a journal's online presence, a publisher needs to gain an understanding of how readers will navigate to the journal and at what part of the journal web site they will arrive. This will help inform decisions on which partners to work with, how to distribute essential data to them, and how to design web pages within a journal web site that meet the needs of readers wherever they arrive within the site.

This research focuses on three main forms of reader behaviour with respect to journals; citation searching, core journal browsing, and subject searching. Given these different approaches to the literature, researchers select their most appropriate starting points on the internet (discussed below) and navigate to journal content. The combination of where readers want to perform certain functions (such as search) and on which pages within a journal web site that the reader "lands" as a consequence of their navigational behaviour sheds light on the design and feature-set of a journal's web presence. It also helps inform publishers as to which kinds of starting points they should seek to enable first, for the greatest possible return in reader traffic.

For each type of behaviour this research tested, the survey asked about a number of different starting points, discussed in the previous section.

## CITATION SEARCHING

In this question we asked people to state the importance to them of each starting point when following up on a citation. "**When you need to find a specific online journal article and you already have a reference or citation, where do you start your search? Please rank each option in terms of its importance to you:"** They were asked to rate each starting point as *Very important, Somewhat important, Neutral, Somewhat unimportant,* or *Unimportant.* In calculating the charts, we allocated a score to each of these of 6,4,2,1,0 to each of these respectively and took the average score within each demographic studied. The maximum score for any starting point is therefore 6.

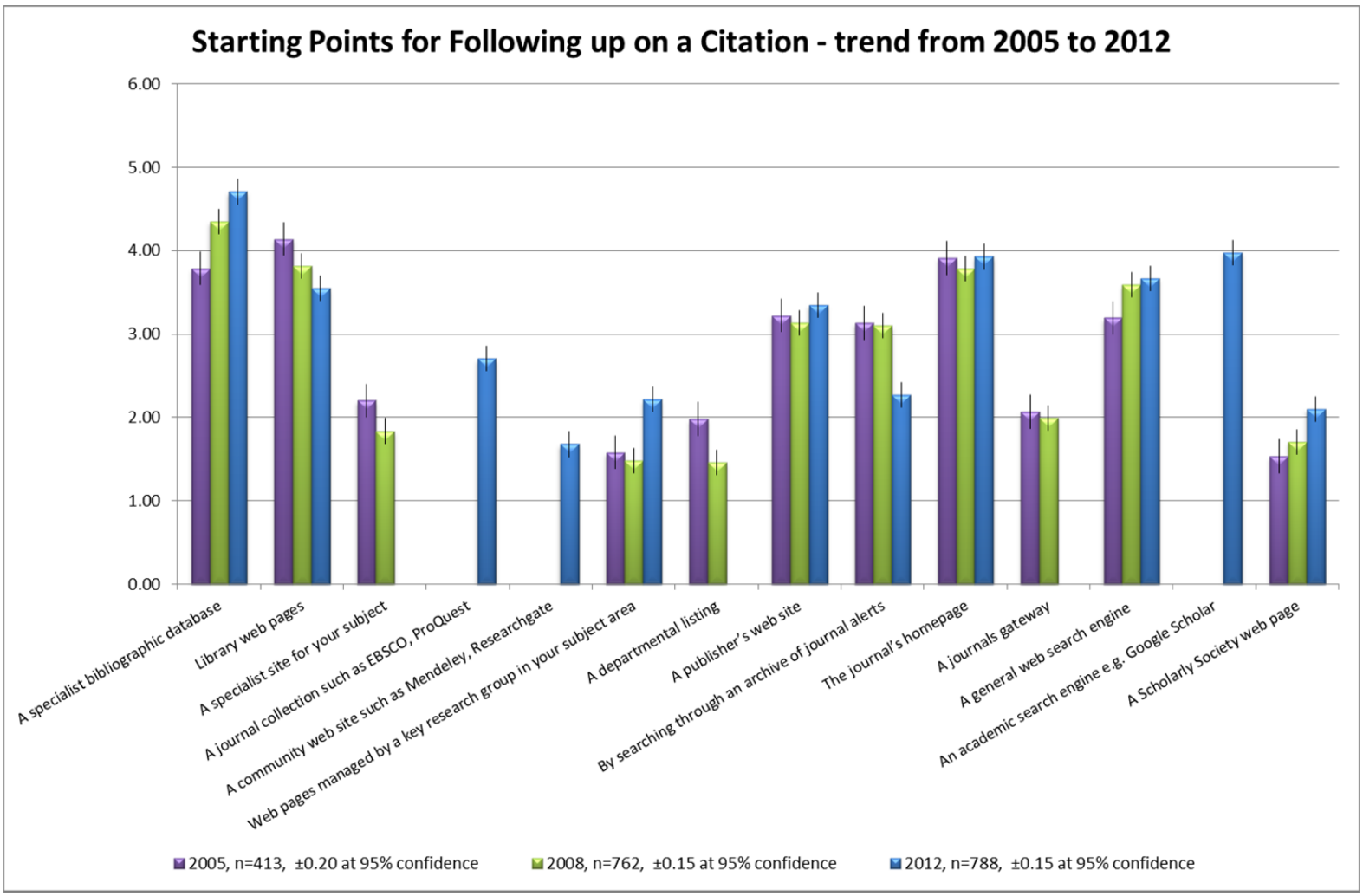


***Figure 12***

As discussed earlier, we chose not to continue with some of the options from the earlier surveys. Terminology in the sector has moved on and moreover the boundaries between what were considered to be "journals gateways" and library web pages has blurred considerably. Community web sites have come online since 2008. In addition, for the first time, this year's survey separates out the use of the likes of Google from Google Scholar, Bing from Microsoft Academic Search. To make a sensible comparison between the much smaller surveys of 2005 and 2008 and this one, the 2012 data has been down-sampled using a random selection method to give a sample of approximately the same size as the 2008 study and with the same subject mix as before. This sample is biased towards Life Scientists in North America and Europe and so in comparing these data with other charts to follow the reader will notice some significant differences between these 2012 figures and those from other demographics.

For this sample of respondents, we see that use of a specialist bibliographic database continues to climb. Given the comments made in the survey it is not surprising – so many life scientists commented that they use PubMed almost exclusively. As in previous years the survey shows that readers faced with a citation seem to know their subject areas well enough to go directly to the web site of the journal to follow up on the citation, whilst the use of library web pages in this regard is in steady decline over the period. Web pages managed by a key research group have increased since 2008. Given the margin for error, there is no significant difference in respondents using the publisher's website or the journal's homepage to look up a citation. More respondents are using a Scholarly Society web page to look up article citations than in 2005 and 2008. Another feature of this year's results is that readers of online journals seem to have become much savvier about their information discovery. Some of the options that seemed oddly popular to us in the past, such as using an archive of ToC alerts to follow up on a citation, have declined in popularity in 2012. Academic search engines such as Google Scholar are more popular than general web search engines and are the second most popular source for looking up a citation, after the bibliographic databases.

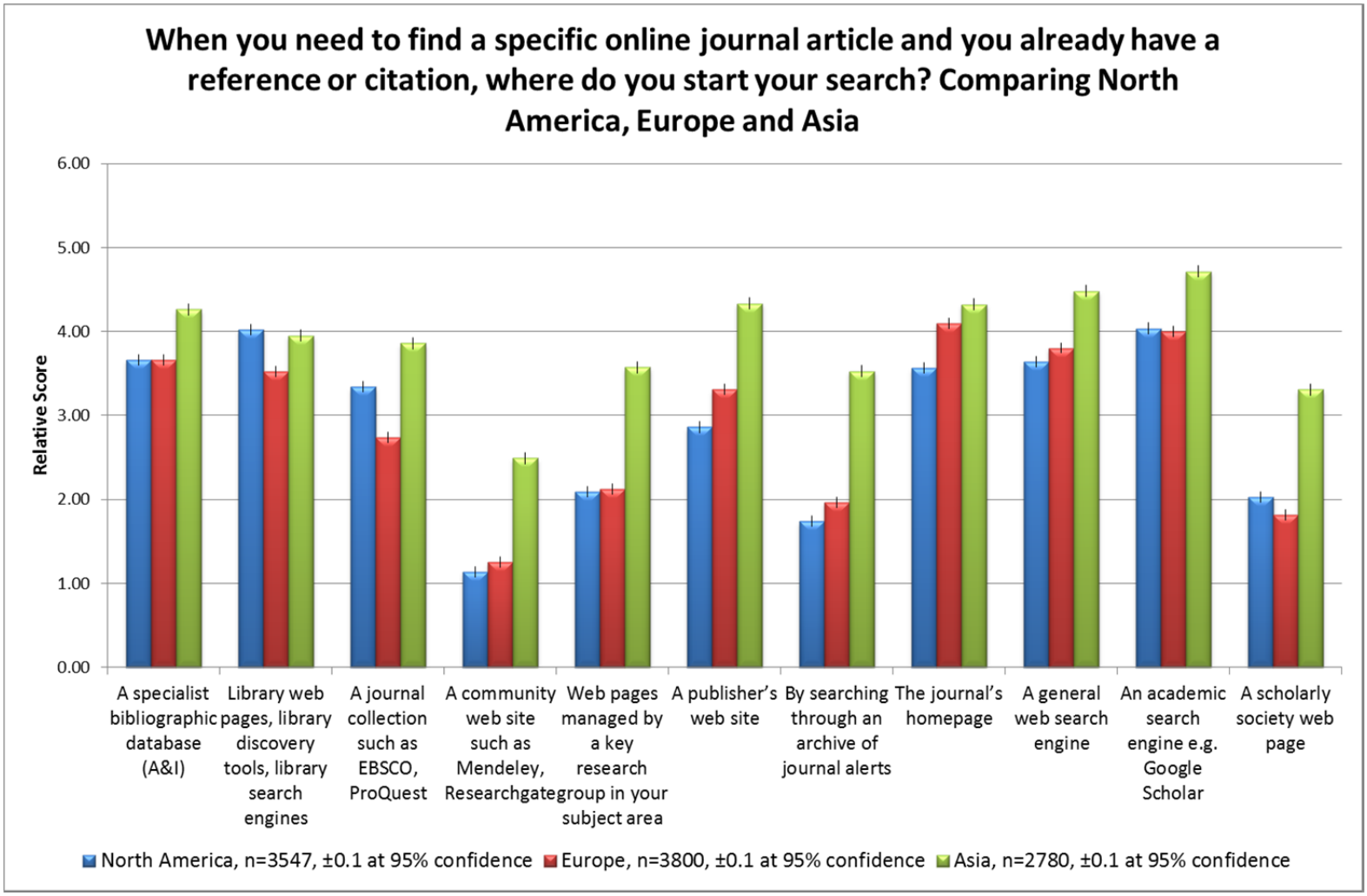


*Figure 13*

Asian readers appear to use even the lesser-used resources much more than their European or North American counterparts, such as community web sites, journal alerts, scholarly society web pages and a research group site. Once again, Asian readers say they use all resources more than the other groups, with their use being fairly spread out amongst many resources. This may be a cultural difference in how people rank resources, or may actually just reflect a wider adoption of discovery resources.

North Americans are most likely to use an academic search engine or the library web pages if they have a citation, whilst Europeans are more likely to go to the journal's homepage.

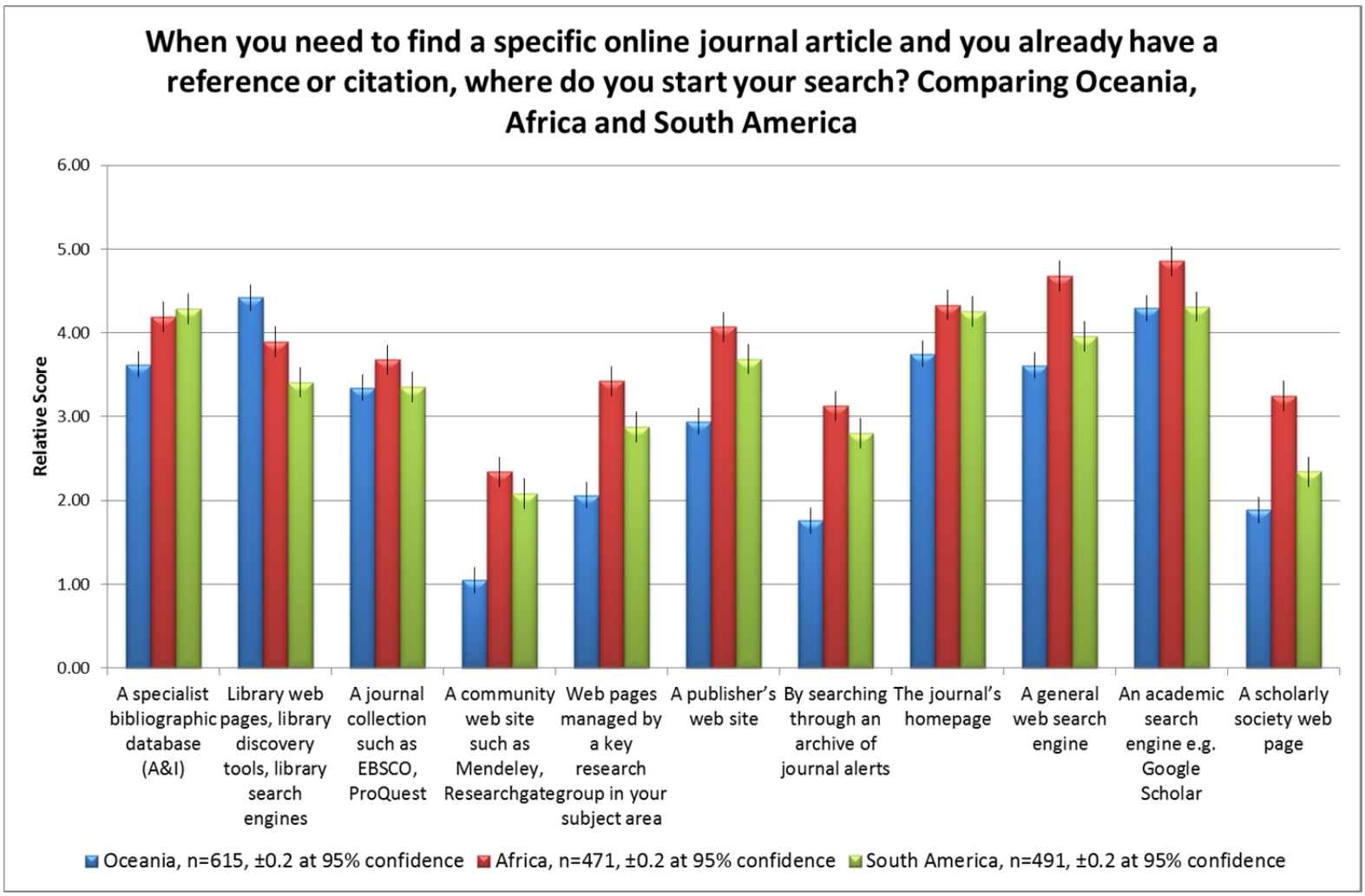


*Figure 14*

People in Africa are most likely to use an academic search engine, a general search engine or the journal's home page if they already have a citation, although use of A&I databases is also high in this region and is on a par with a publisher's web site. As in Asia previously, African respondents seem to make more use of all resources available to them. South Americans will use similar resources to the Africans but the use of a general search engine is slightly lower. In contrast, respondents in Oceania are most likely to use the library web pages first if they already have a citation, which could indicate that the level of adoption, sophistication and promotion of library technology in this region is quite high. Overall, people in Oceania have a lower use of all resources apart from library web pages. This is especially true of community web sites, research groups, publisher web sites and journal alerts. Use of general search engines for this type of activity is less than both other regions. South Americans use academic search engines, the journal's homepage and A&I databases the most.

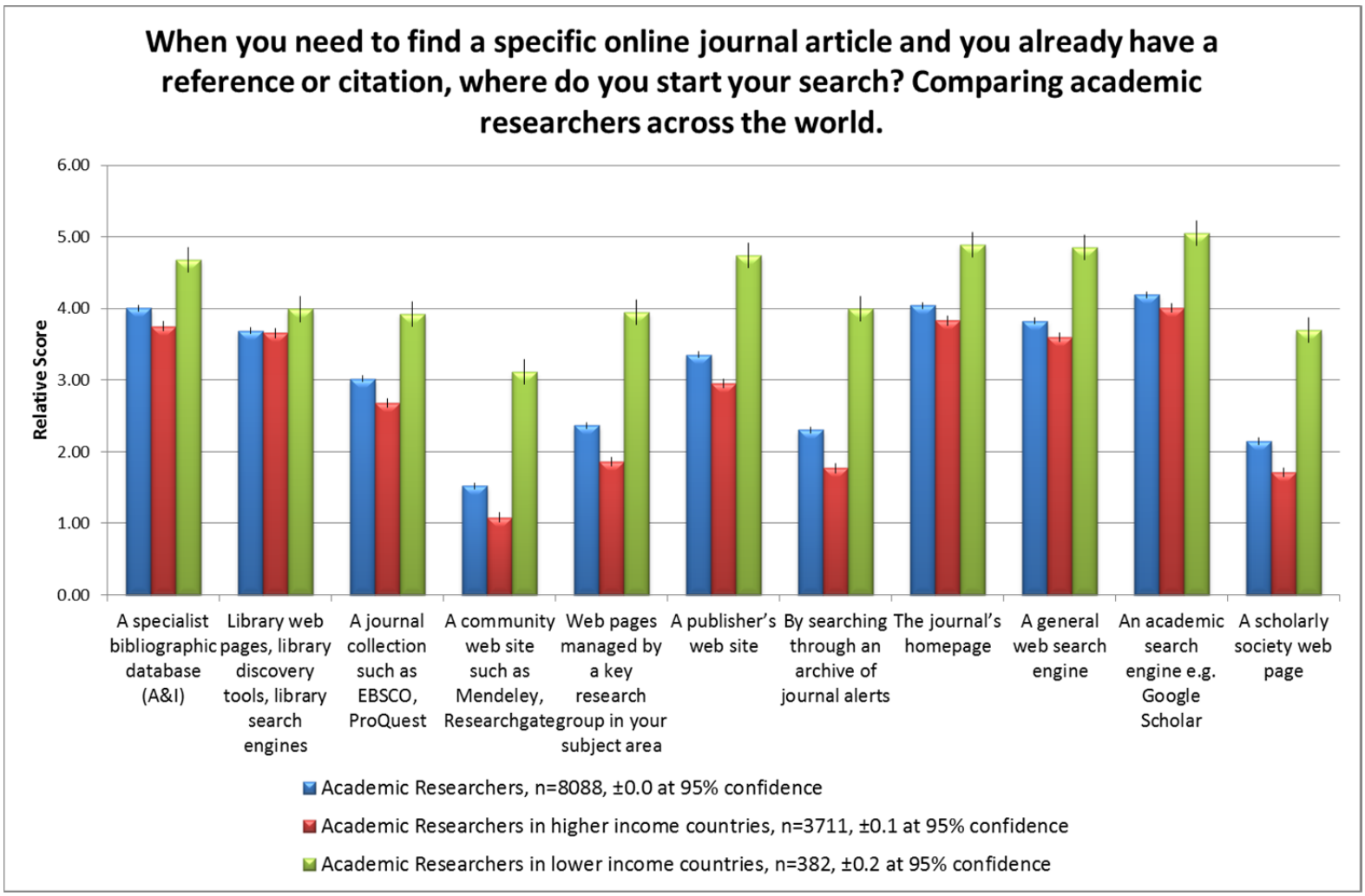


*Figure 15*

This chart shows that generally lower income country researchers have ranked everything more highly than their higher-income-country counterparts. (For this reason, in many subsequent demographic analyses we compare only the higher income country outcomes.)

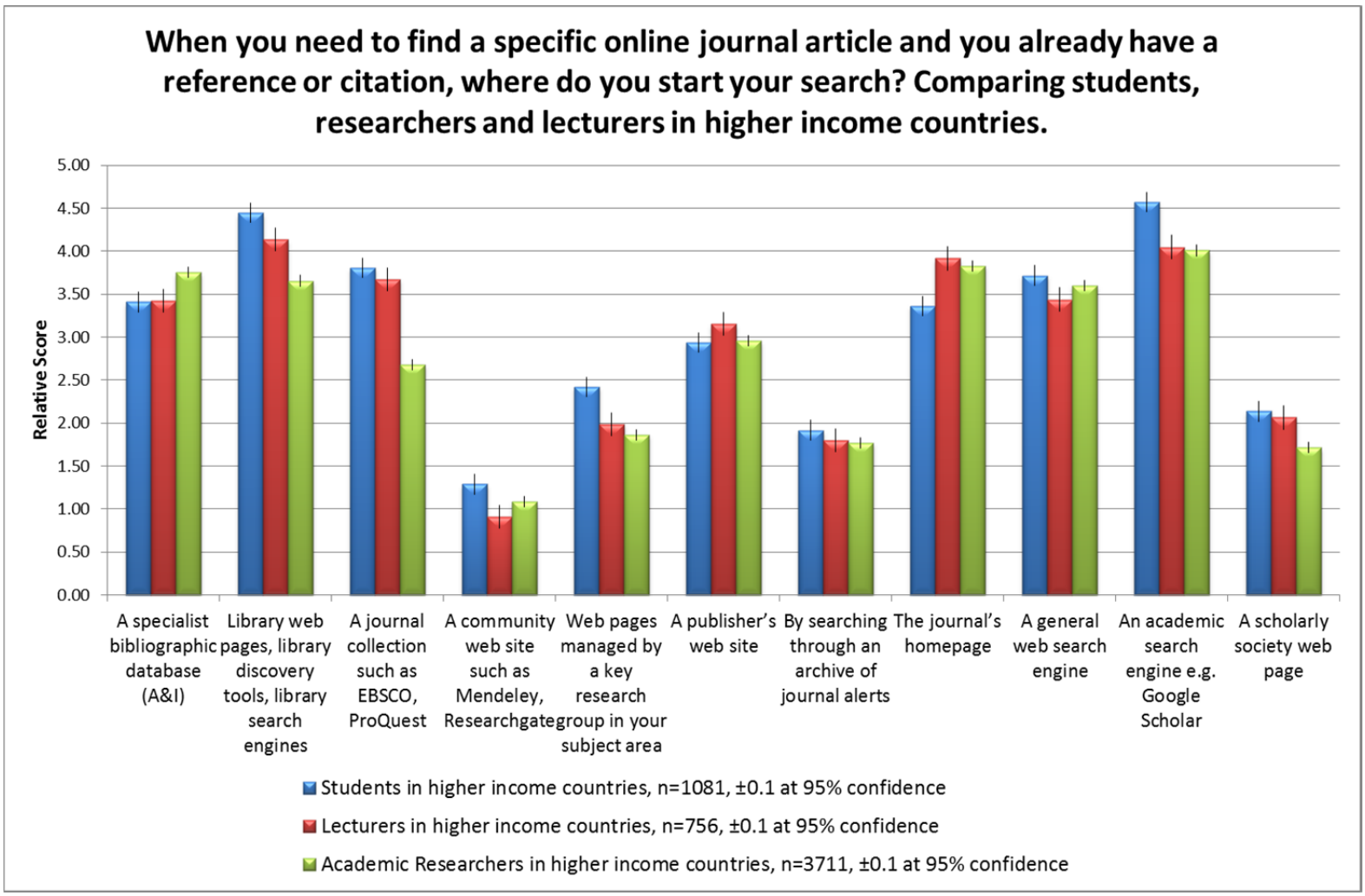


*Figure 16*

For students, the academic search engine and library web pages seem to be equally important in following up a citation. More senior readers rank journal home pages more highly than do students, probably due to their brand familiarity. Academic researchers make significantly lower use of journal collections than do lecturers or students in this regard, but make slightly greater use of A&Is.

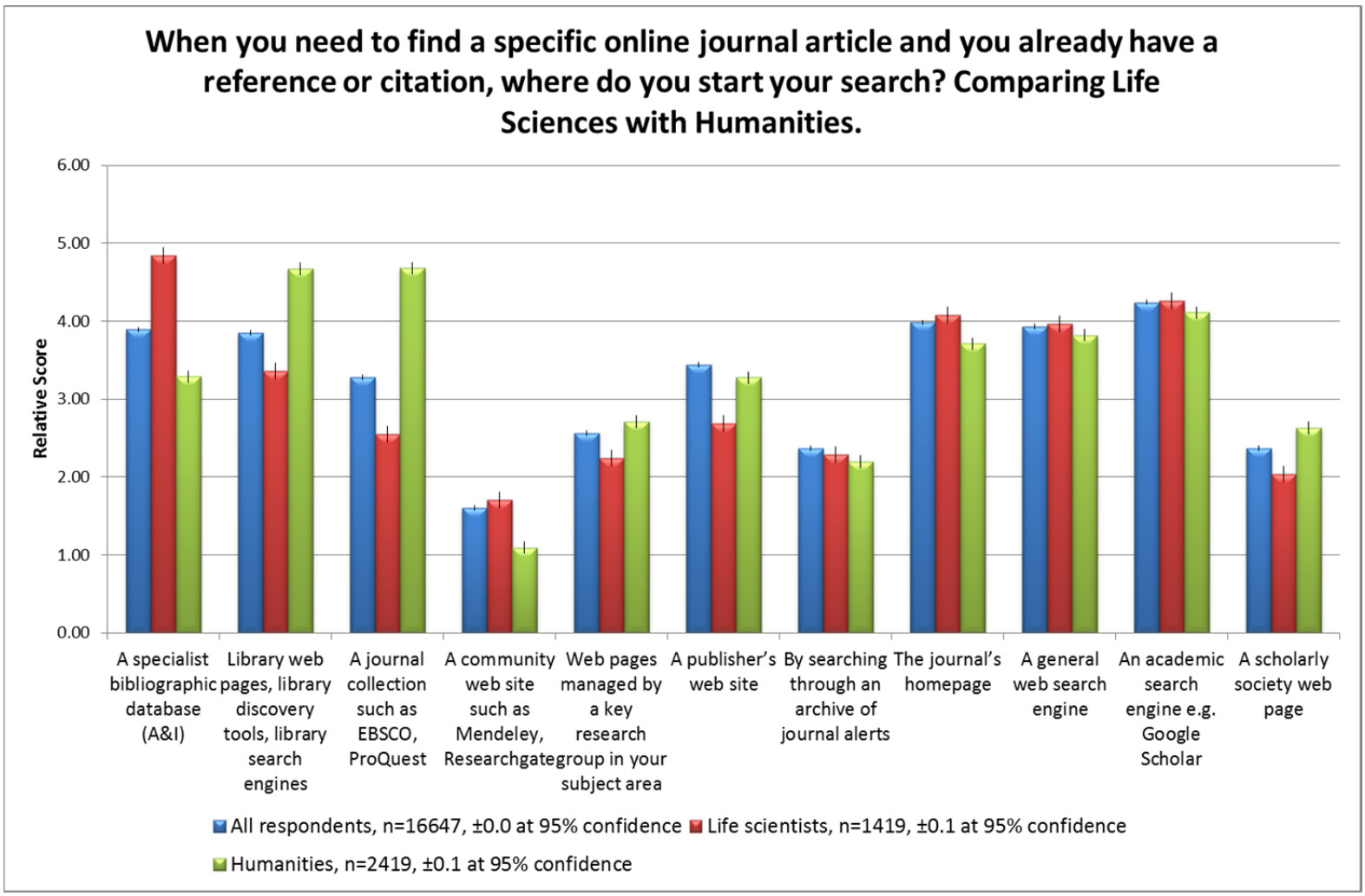


*Figure 17*

This chart compares the behaviour of Life Scientists with those in Humanities. Life Scientists make much greater use of A&Is, while those in Humanities rely much more on library web pages and especially aggregated collections of journals. Those in Humanities make less use of community web sites but somewhat surprisingly make more use of scholarly society web pages. Those in Life Sciences make much less use of aggregated collections of journals. Use of search engines, academic search engines and journal alerts is very similar across these two subject areas. People in Humanities use a journal's homepage slightly less than Life Scientists but significantly more than the same group when looking for a citation. People in Humanities use a community web site less than Life Scientists but their use of research groups is higher.

Overall, the most popular discovery methods in Humanities, when the user has a citation, are library web pages and journal collections. In Life Sciences, A&Is dominate, presumably PubMed being a major part of this.

This same chart was plotted using data from high-income areas, as was done in the analysis of the questions on search behaviour, see Figure 35. However, unlike the search behaviour charts, the data for following up on a citation is invariant with income. This is interesting because it seems to show that search behaviour is affected much more by wealth than the behaviour shown when following up on a citation.

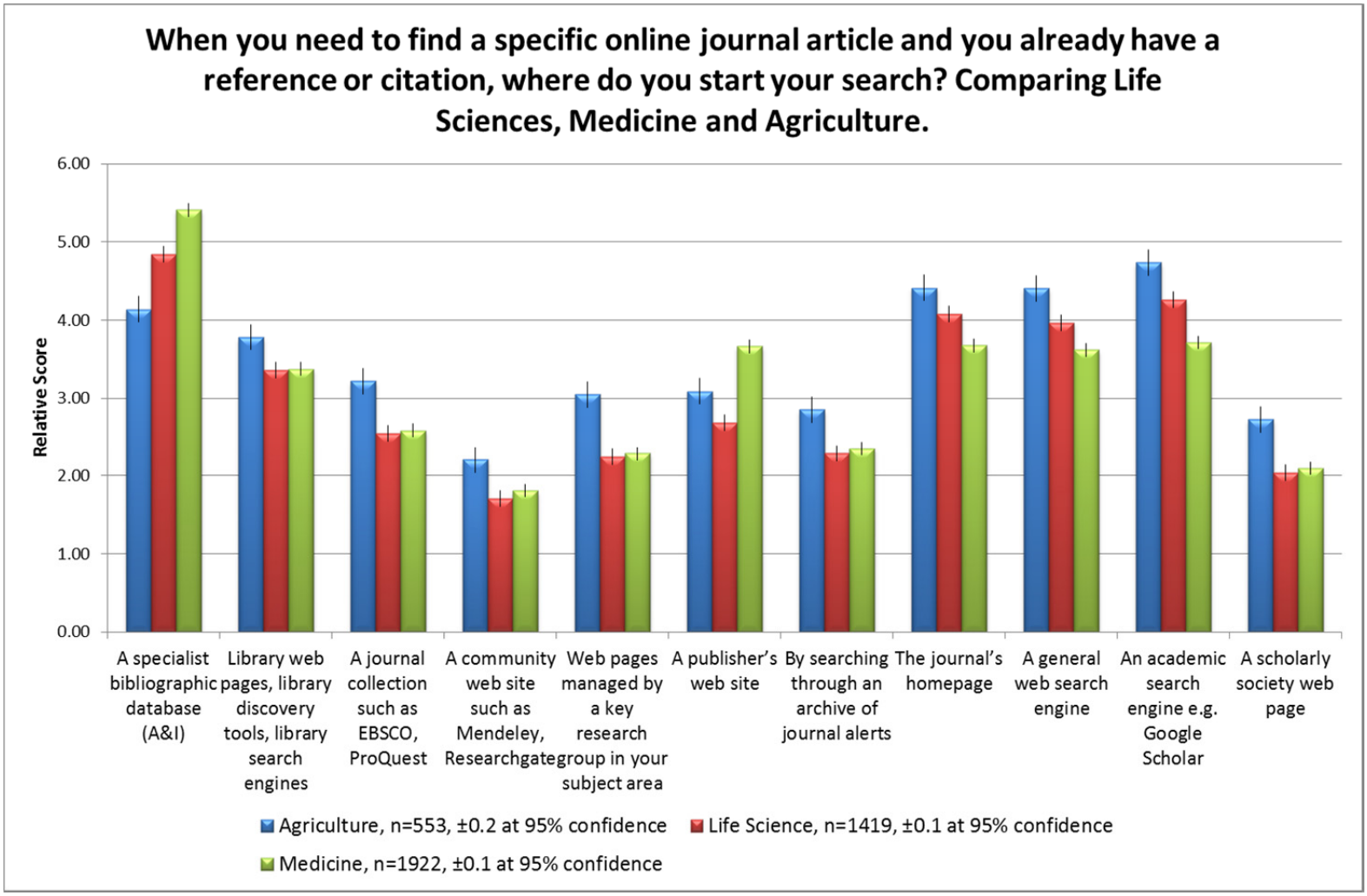


***Figure 18***

Those in Medicine make even greater use of A&Is than the Life Scientists for this type of activity. They will use the publisher's web site more than Life Scientists and Agriculturalists, but use the journal's home page less, which could indicate that it is the publisher brand rather than the journal with which they identify, or that medical collections are being searched. They also do not use general search engines or academic search engines as much as other groups and relatively speaking use these tools significantly less than the A&Is. This could be because of the dominance of PubMed. Agriculturalists make less use of the A&Is than other groups, but more use

of all of the others and they are most likely to visit a search engine or the journal home page if they already have a citation.

### COMMENTS

From the comments given to this question many people in Life Science and Medicine value PubMed above all other routes. There was no category provided in the survey for author web pages, however a small number of people commented that these were extremely important to them. Several other respondents mentioned they went to their library staff or search the DOI registry. In Mathematics and Physics, ArXiv and INSPIRE were both noted as being very important by many people. Respondents in Social Sciences commented on a much more varied list of resources including "*my husband's library because mine is so bad*". One respondent in this subject commented "*when I already have the citation, I will choose my starting place per path of least resistance (fewest steps and most options, all costs being equal)".*

## CORE JOURNAL BROWSING

The second behaviour studied is the user who regularly reviews a few select journals that he considers worth scanning upon publication.

In this question we asked people to state the importance to them of each starting point when reading their core content: "**When you wish to view the latest issues of your core online journals, how do you navigate to those journals? Please rank each option in terms of its importance to you:"** They were asked to rate each starting point as *Very important, Somewhat important, Neutral, Somewhat unimportant,* or *Unimportant.* In calculating the charts, we allocated a score to each of these of 6,4,2,1,0 to each of these respectively and took the average score within each demographic studied. The maximum score for any starting point is therefore 6.

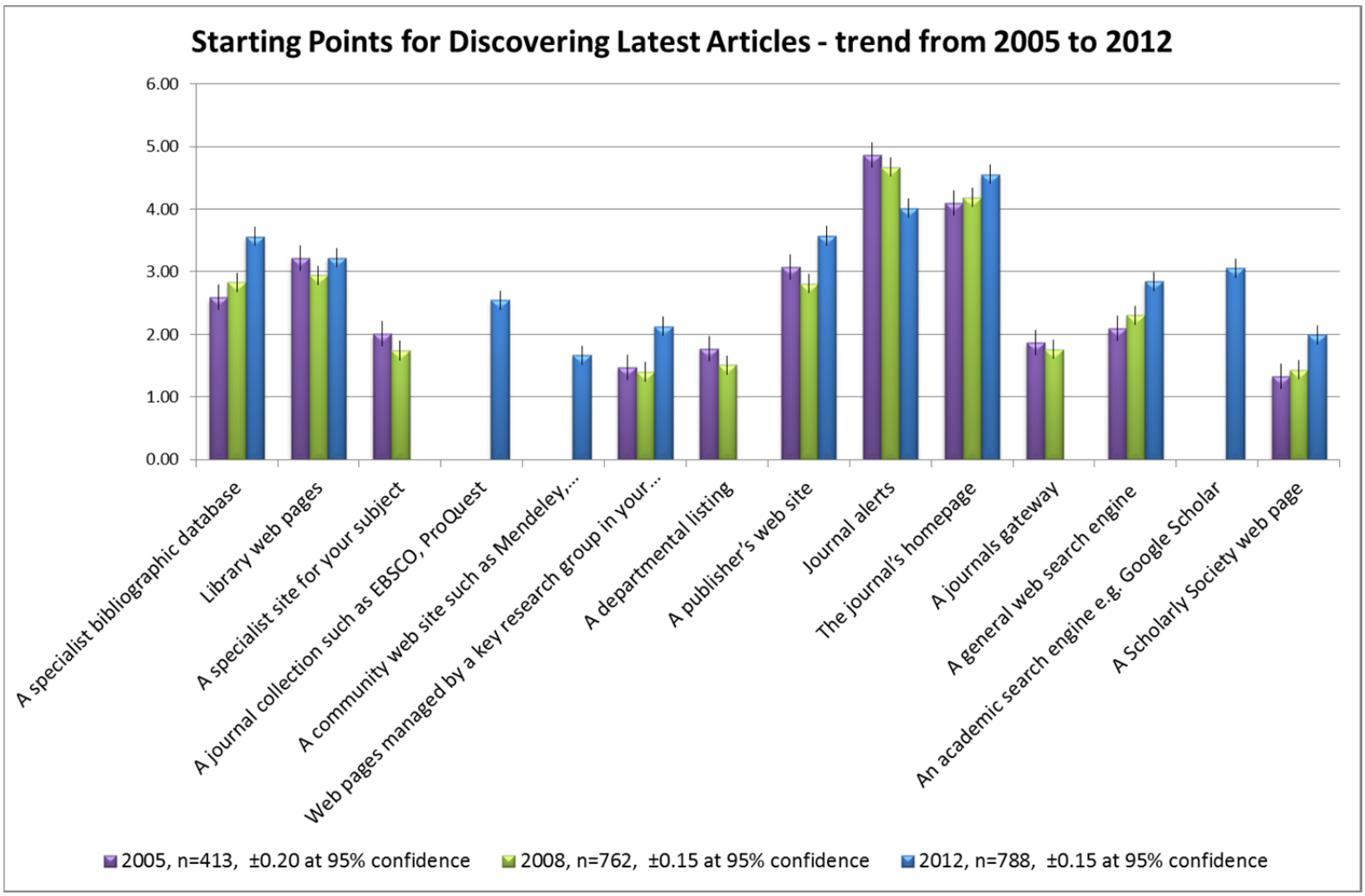


***Figure 19***

This chart shows the trend in behaviour for readers who wish to discover the latest articles in their subject area. A&I databases continue to grow as a resource for this type of behaviour. A publisher's web site, journal homepages and scholarly Society web pages have all grown in popularity, perhaps indicating that readers are becoming more familiar with journal and publisher brands. Web pages managed by a key research group has also grown, indicating perhaps the growing success of some of these resources. Showing a significant downward trend is journal alerts, however it is still the second most popular resource for discovering latest articles.

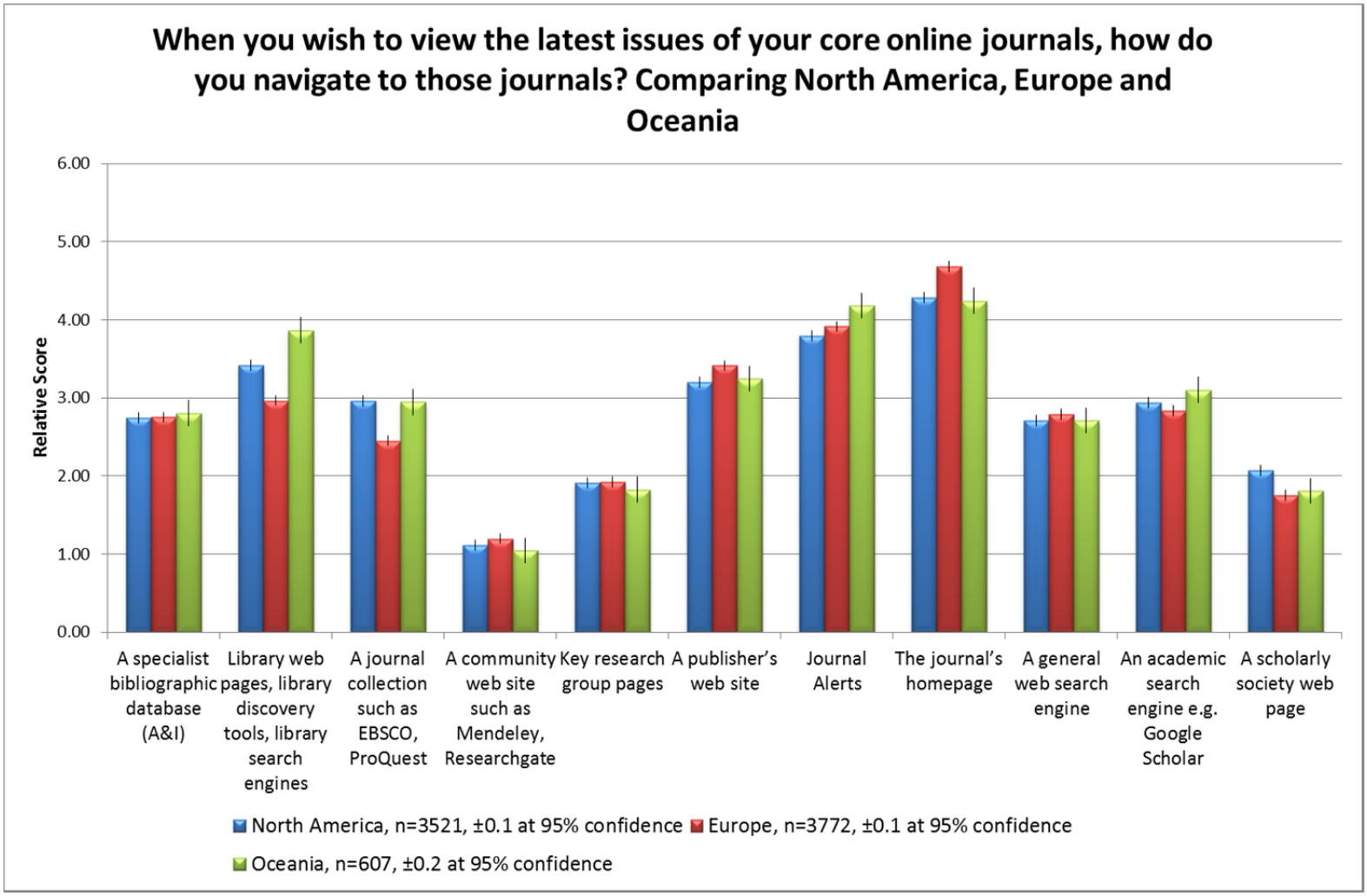


*Figure 20*

Readers in Oceania make greater use of library web pages than in either North America or Europe, while readers in Europe make the greatest use of journal homepages in this mode of use. Journal pages and journal alerts are generally the most important starting point. The use of library web pages in Oceania mirrors that found for following up on a citation in Figure 14.

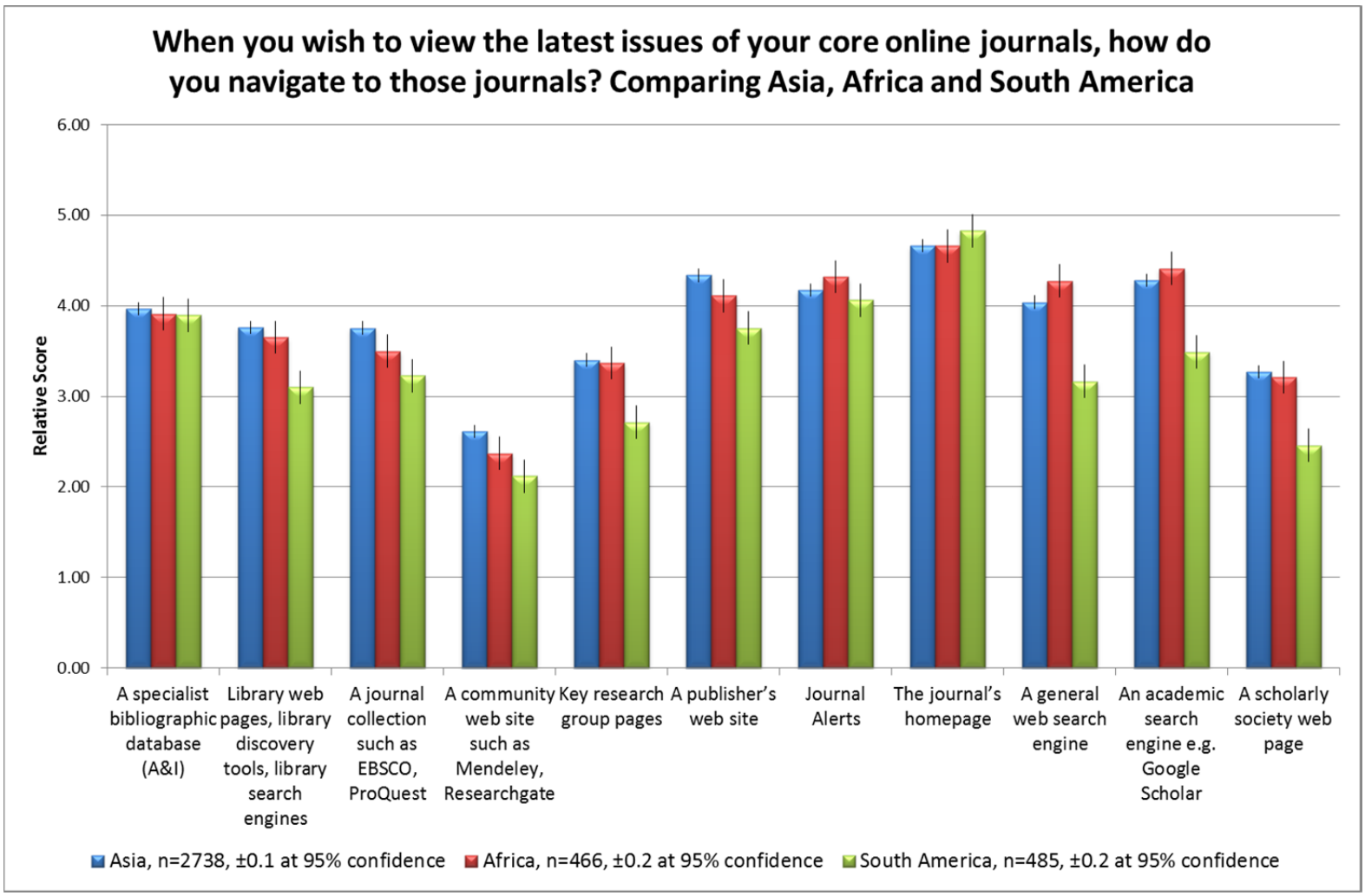


***Figure 21***

Generally, readers in these regions rank most of the resources for regular reading more highly than those in North America, Europe and Oceania. This is a recurrent theme in this research and it is hard to know whether this is a cultural difference with respect to completing surveys, or a real one. The only significant exception and deviation from this norm is the use of search engines in South America for this purpose.

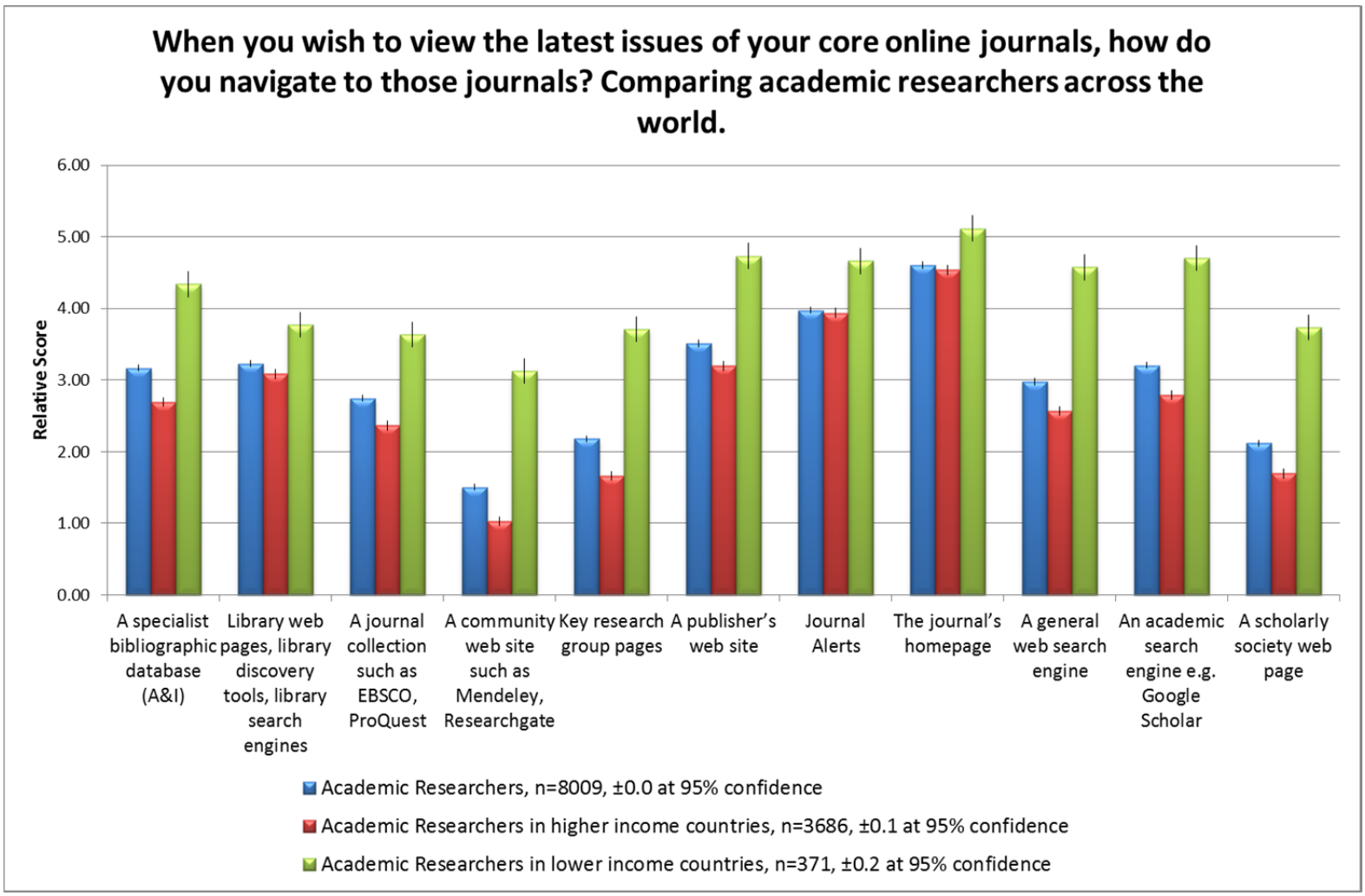


*Figure 22*

This chart shows that generally lower income country researchers have ranked everything more highly than their higher-income-country counterparts. For this reason, in many subsequent analyses we compare only the higher income country outcomes.

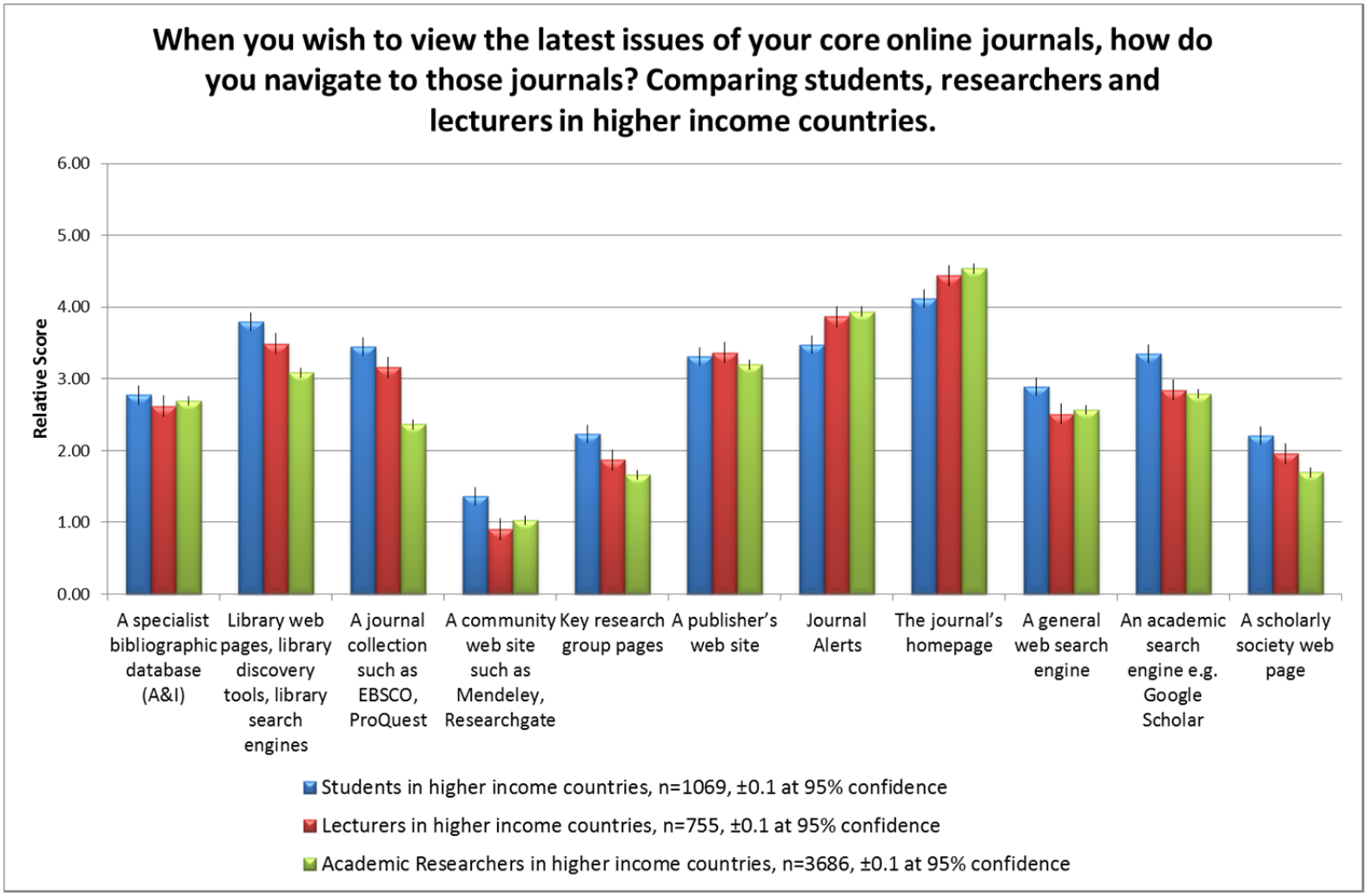


*Figure 23*

For senior roles, the journal home page and journal alerts are the two most important means of discovery for latest issues; however, students consider library web pages as important as their senior counterparts view alerts. Students make greater use of community web sites than their more senior colleagues, but in absolute terms this is still small. This theme is repeated in search and citation lookup results - see Figure 11 and Figure 28.

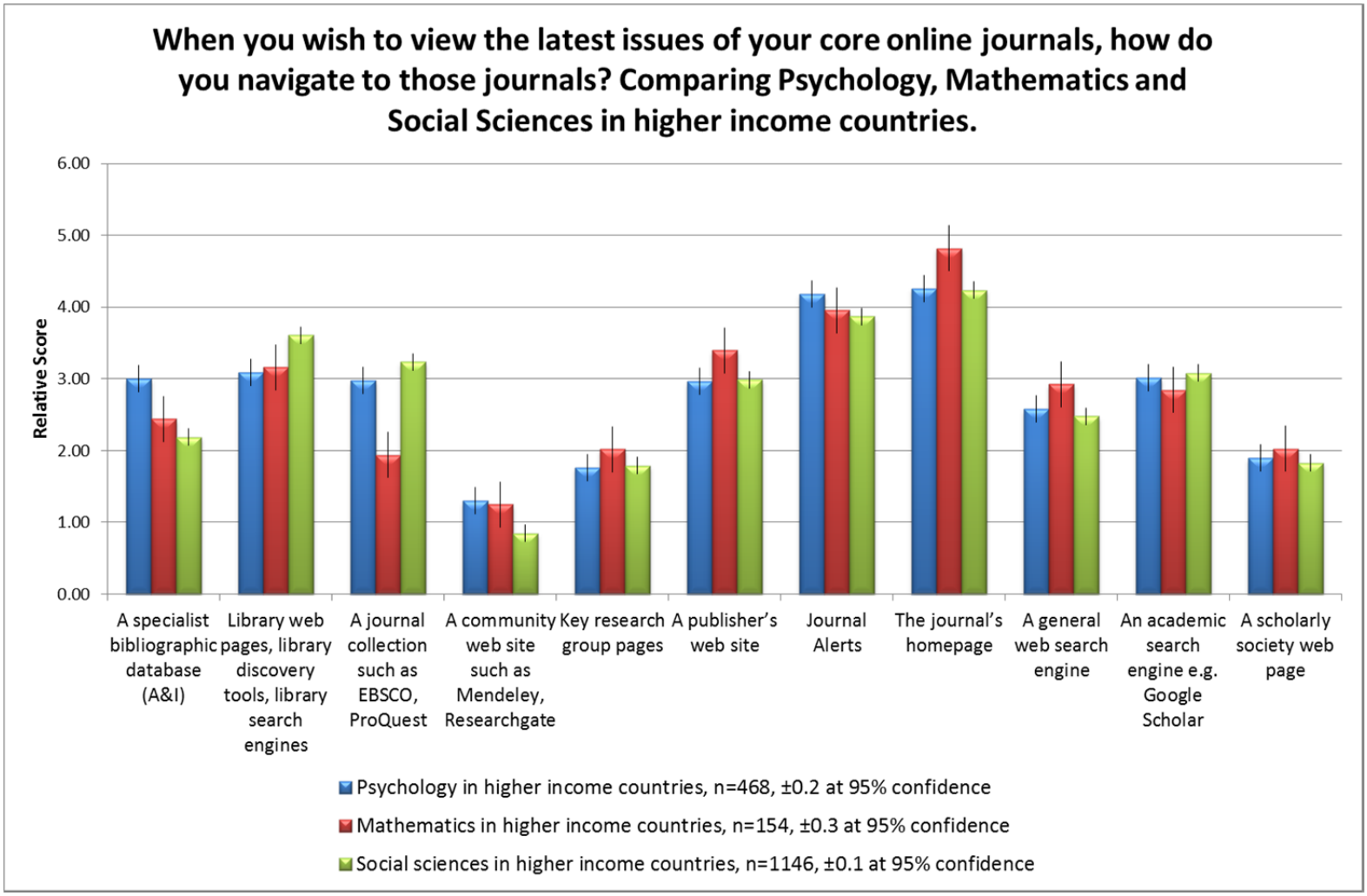


*Figure 24*

Mathematicians use journal aggregations much less to view latest issues than their contemporaries in psychology and social sciences.

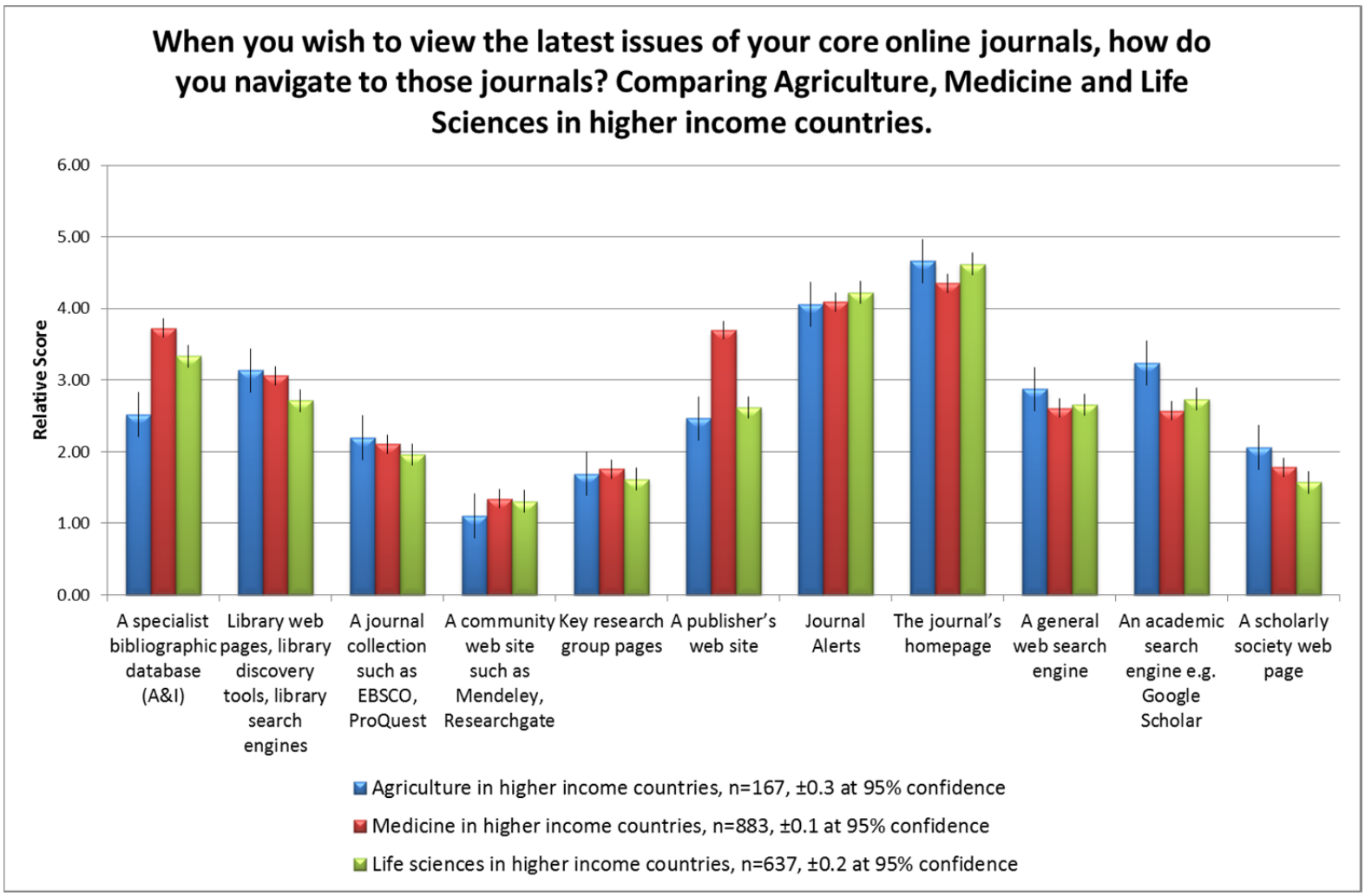


*Figure 25*

The two significant variations from the norm here are how few individuals in Agriculture rank A&Is as a good starting point in this regard in comparison with Medicine and Life Sciences, and also how much more those in Medicine consider the publisher web site as a good starting point than the others.

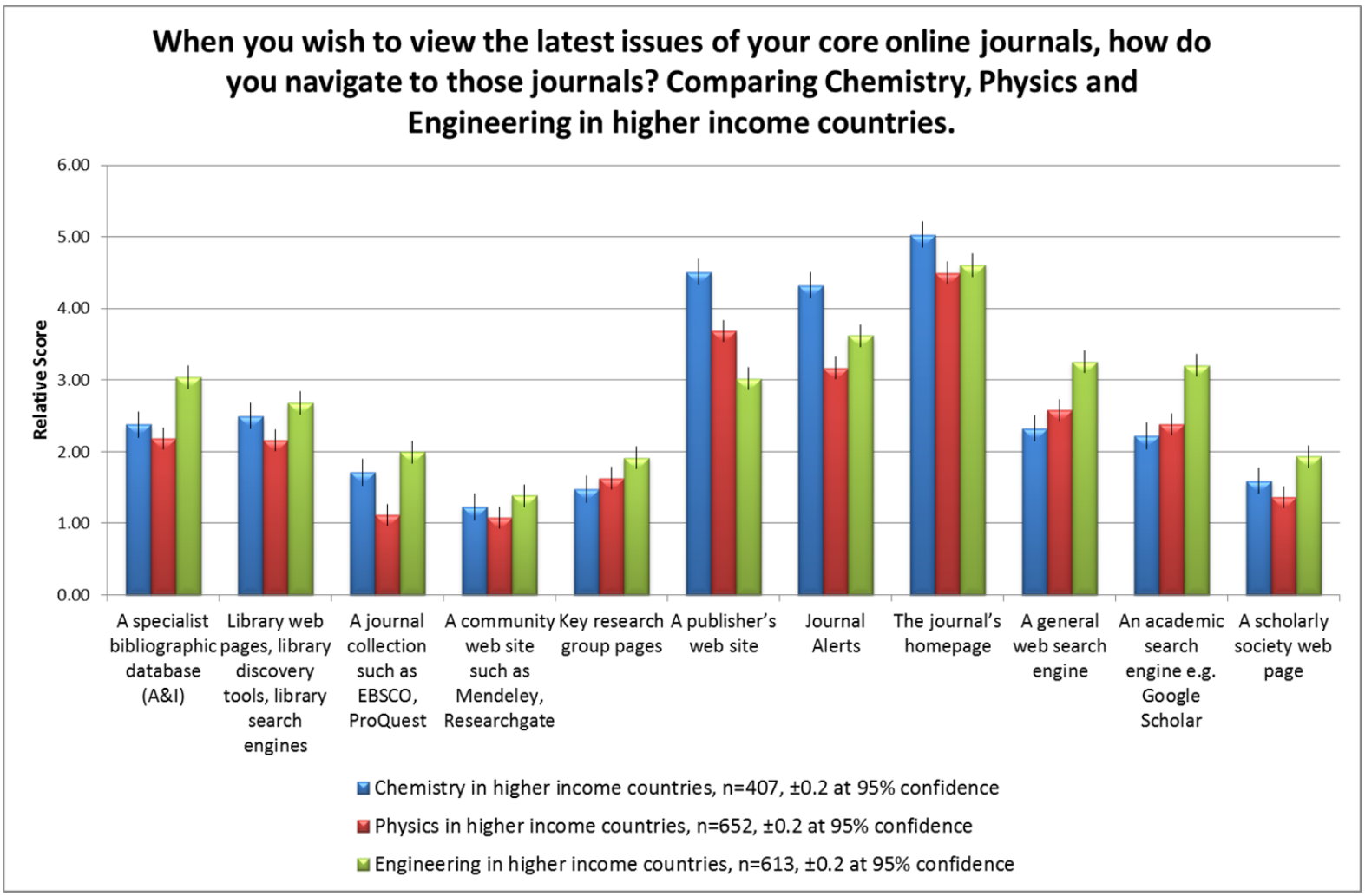


*Figure 26*

ToC alerts are significantly more valuable to Chemists than in other physical science areas. This might be because chemists really appreciate the graphical ToC alerts so typical of the subject.

Chemists seem to make much more use of the primary publisher's resources (alerts, publisher site and journal pages) than other subject areas. It may be that the specialist nature of these web sites makes them much better suited to browse than other potential starting points which may be more general.

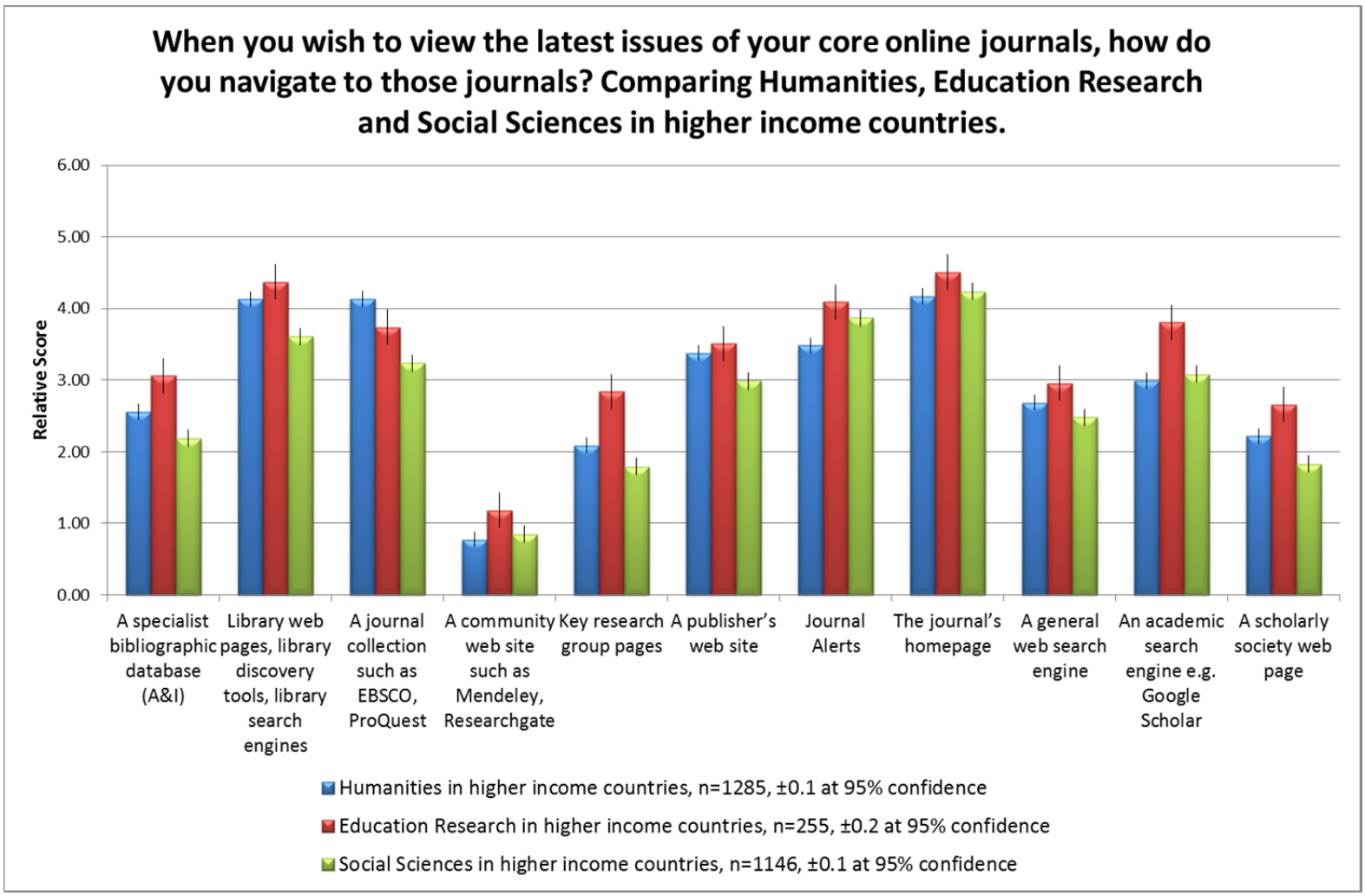


*Figure 27*

In Education Research and Humanities, library web pages are just as important as journal alerts and the journal's home page. Education Researchers are greater users of academic search engines and of web pages maintained by key research groups than the other subject areas. Social Scientists appear to use journal aggregations less than those in Humanities for reading the latest articles. All of these subject areas rank library web pages and journal aggregations more highly than the physical scientists, medics and life scientists shown in earlier figures.

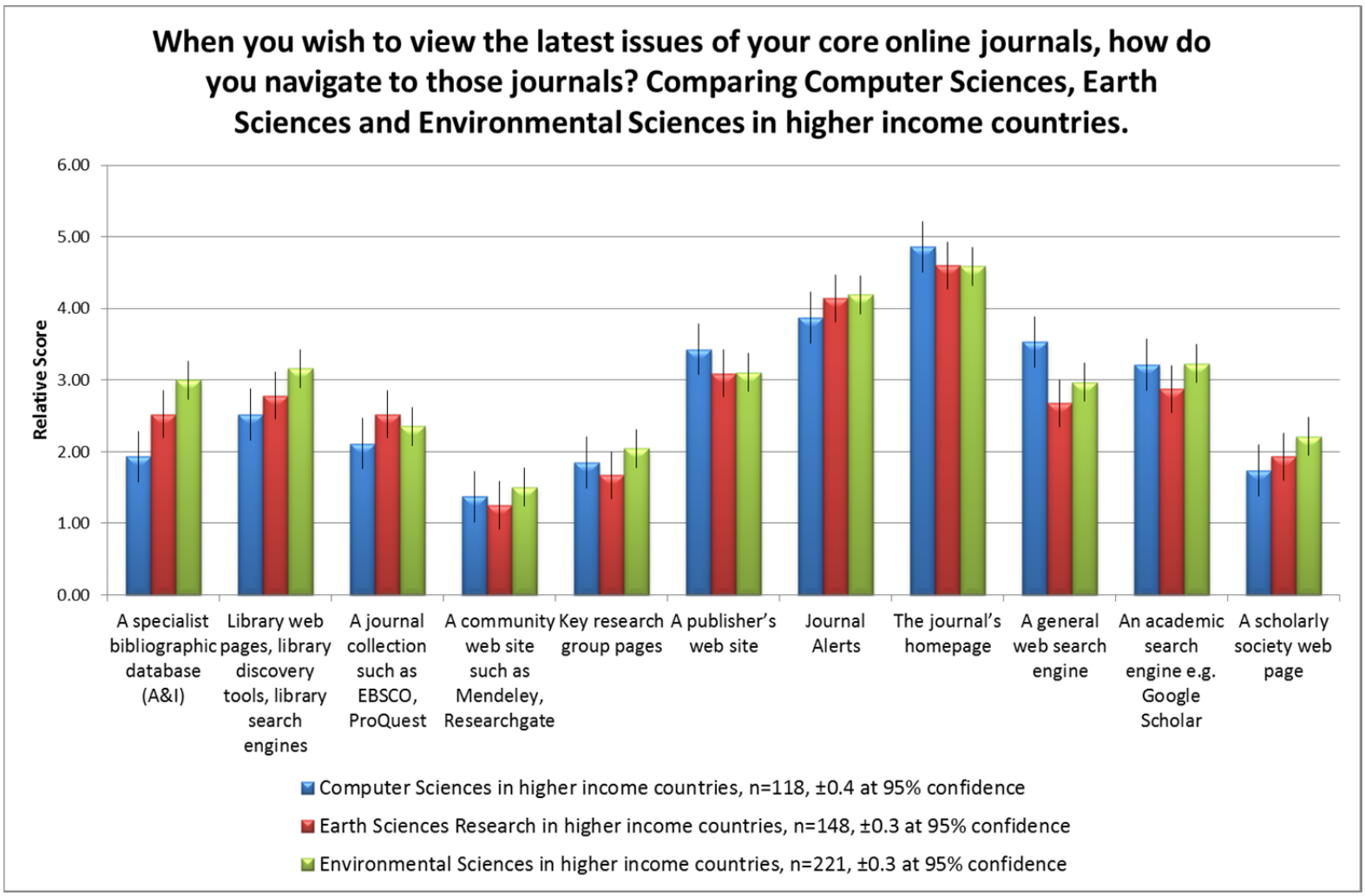


***Figure 28***

Note that for these subject areas the sample sizes are relatively small and so the error bars are quite large. As such there are very few reportable differences between these subject areas.

## COMMENTS

A small proportion (about 200) of respondents noted that email alerts and RSS feeds were very important; however a number of respondents also commented that they didn't perform this type of activity, that they had no sense of "core journals", they just researched the topics they needed to. For the people who use ToC alerts, it could be assumed that they are a very important route. ArXiv was also noted as an important route for this type of activity.

"*Nowadays virtually all leading research in math is uploaded to arxiv, so it is enough to read their daily emails. There is no point in viewing the recent*

 

*journal issues, as arxiv is one year ahead of them anyway*". – Respondent in Mathematics

*"Don't ever view latest issues, as don't know how, too many relevant journals & don't have time; just rely on searches",* Respondent in Engineering

*"Again, the navigation depends on the subjects, as some topics are more easily found in some areas and others in other pages, search engines, etc."* – Respondent in Education Research

## SUBJECT SEARCHING

The third form of user behaviour studied occurs when a user is searching for articles on a specific subject. A user is likely to undertake a comprehensive subject search prior to undertaking research in a specific field or when seeking to check, prior to publication, the precise state of the current literature.

In this question we asked people to state the importance to them of each starting point when reading their core content. "**When you need to do a search for articles on a specific subject, where on the web do you start that search? Please rank each option in terms of its importance to you:"** They were asked to rate each starting point as *Very important, Somewhat important, Neutral, Somewhat unimportant,* or *Unimportant.* In calculating the charts, we allocated a score to each of these of 6,4,2,1,0 to each of these respectively and took the average score within each demographic studied. The maximum score for any starting point is therefore 6.

 

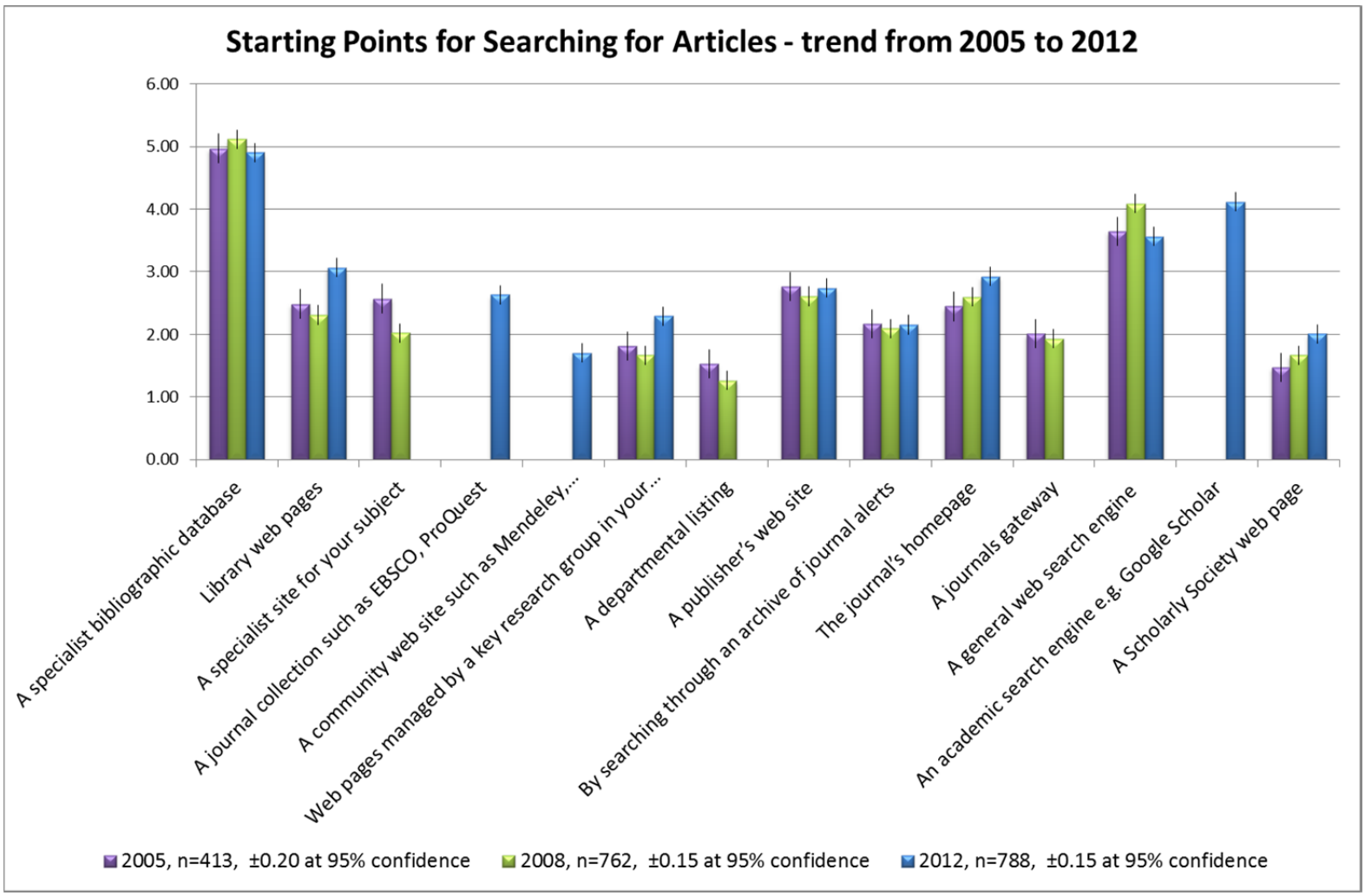


***Figure 29***

This question asked respondents about their behaviour when searching for articles on a subject. The graph shows quite different responses to the other two types of behaviour we asked about – following a citation and viewing the latest articles. Specialist bibliographic databases (A&Is) are still the most popular resource for this type of activity and allowing for a margin of error, shows no significant change over time. Library web pages however have grown significantly in popularity, possibly due to the introduction of web scale discovery services. At the same time general web search engines have shown a slight downward trend, possibly because the additional alternative option of an academic search engine was added to the options in the survey. Web pages managed by a key research group and society web pages have both shown a slight upward trend which may be due to changes in publisher marketing strategies resulting in readers becoming more familiar with publisher and society brands. In absolute terms, searching within a journal aggregation is quite significant, as are publisher web sites and journal homepages, the latter of which has shown a significant change since 2005.

As in previous years, all of these methods have a value to someone but the most popular method in this comparison is Abstract and Indexing databases.

## Search Behaviour Correlation

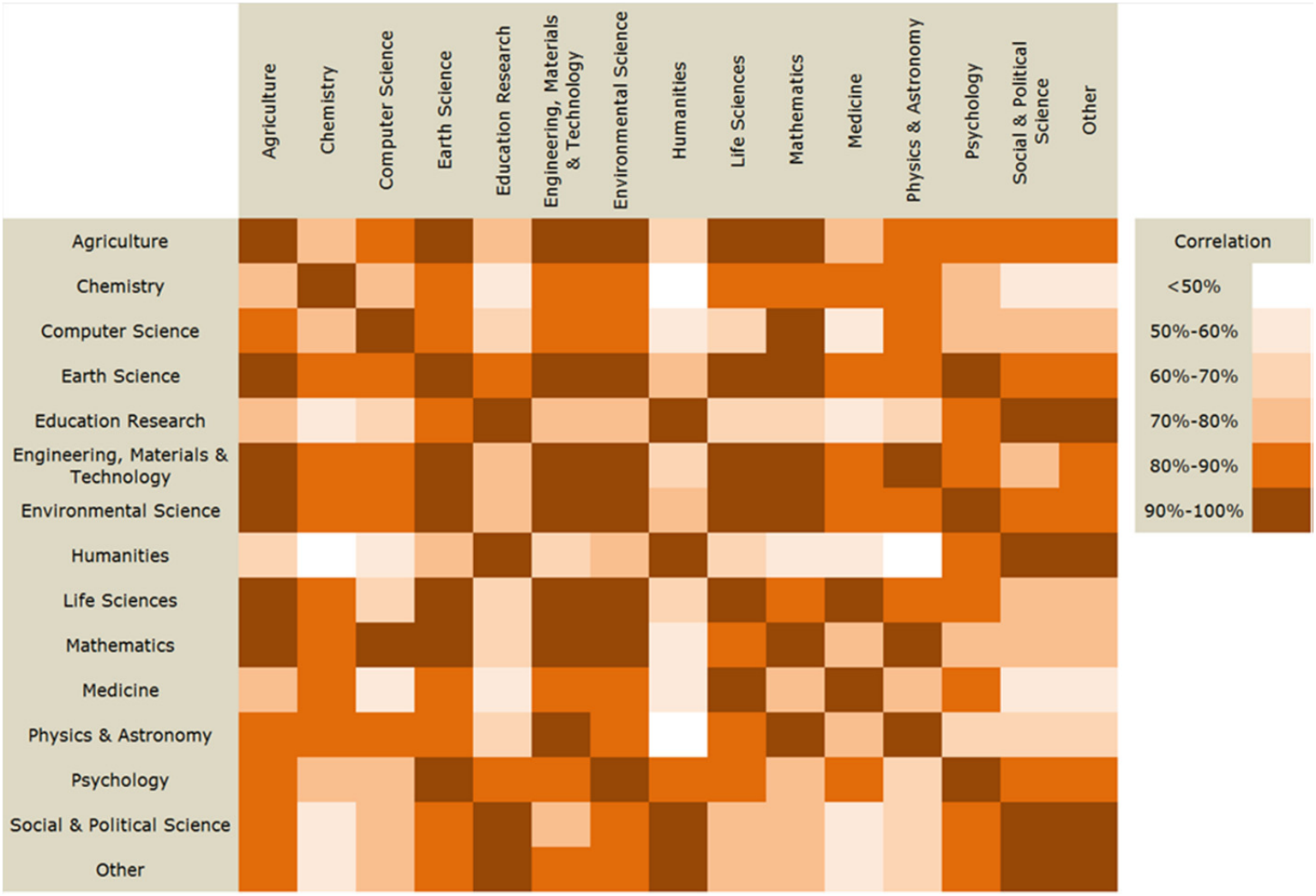


***Figure 30 - Correlation between subject areas in search***

Having taken all of the results for search it is possible to see which subject-categorized behaviours correlate with others the most. The heat map above shows visually the correlations between subjects in search behaviour (spanning attitudes to all of the starting points studied).

Social Sciences, Humanities and Education Research are all closely related to each other. Chemistry is not highly correlated with any other subject. Physics is strongly correlated with Mathematics and Engineering.

Earth Sciences, Engineering, Mathematics, and Environmental Sciences are closely related to many other subject areas.

The "Other" category correlates very strongly (actually 99%) with Social Sciences and also more than 90% with Humanities, perhaps giving us a clue of the identity of those who didn't classify themselves.

## REGIONAL COMPARISONS

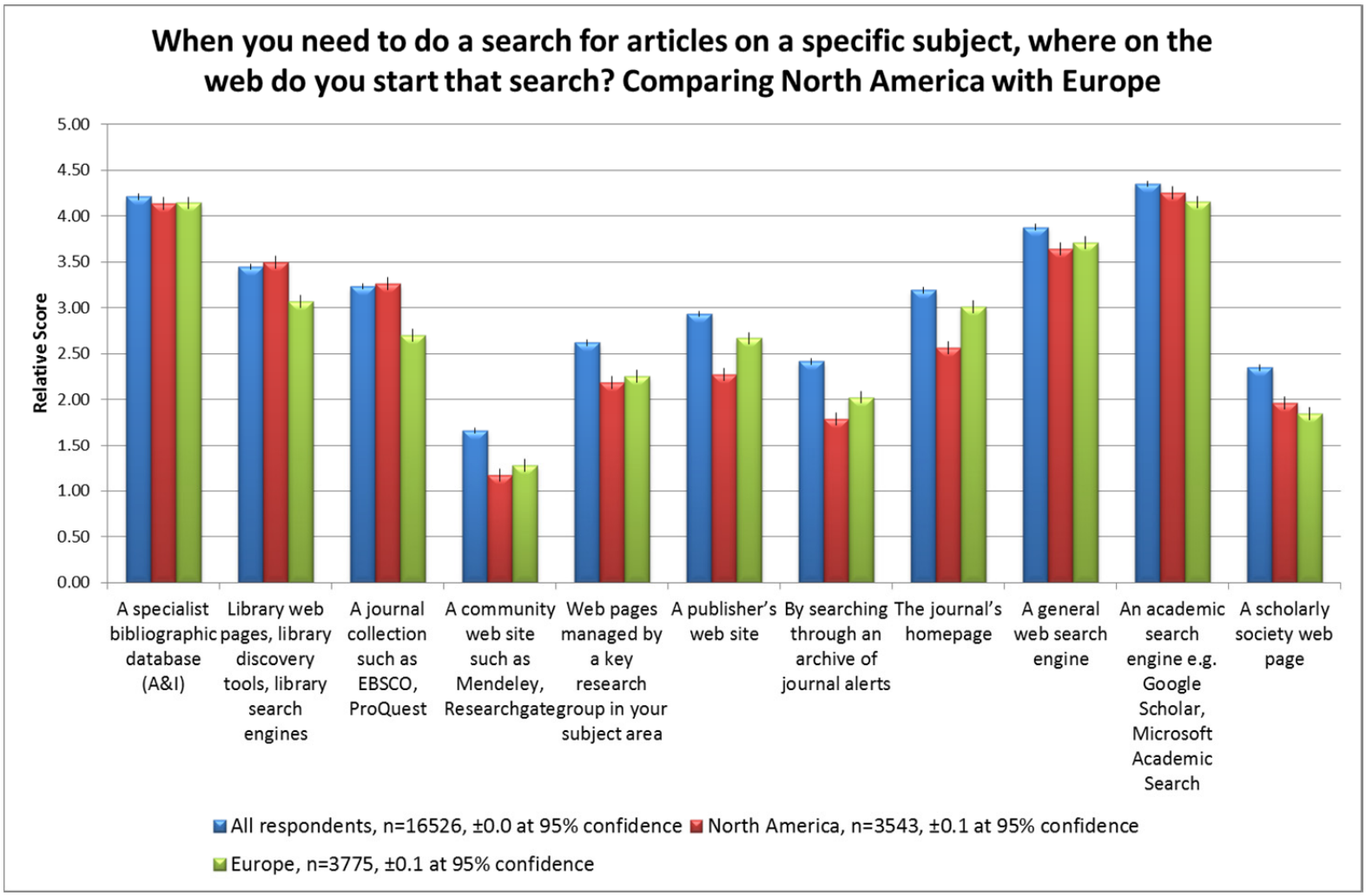


***Figure 31***

This graph shows that whilst there is not much difference between North America and Europe in how readers use A&I databases, and to a lesser extent search engines and academic search engines, there are significant differences in the value they place on other discovery resources. Library web pages are less important in Europe and it would be interesting to know whether this mirrors the take up of Web Scale Discovery services such as Primo, EDS and Summon in these regions. Journal collections are also used a lot less in Europe as a discovery tool than they are in North America. There is very little difference in the way Europeans and North America readers use research group web sites and community sites; however, Europeans use sites owned and managed by the publisher much more

including the publisher web site and the journal home page, and they value their archive of journal alerts slightly more.

In overall terms North American readers value academic search engines and A&I databases the most followed by search engines, library web pages and journal collections. Europeans value academic search engines and A&I databases followed by a general search engine. Use of the library web pages is on a par with the journals home page.

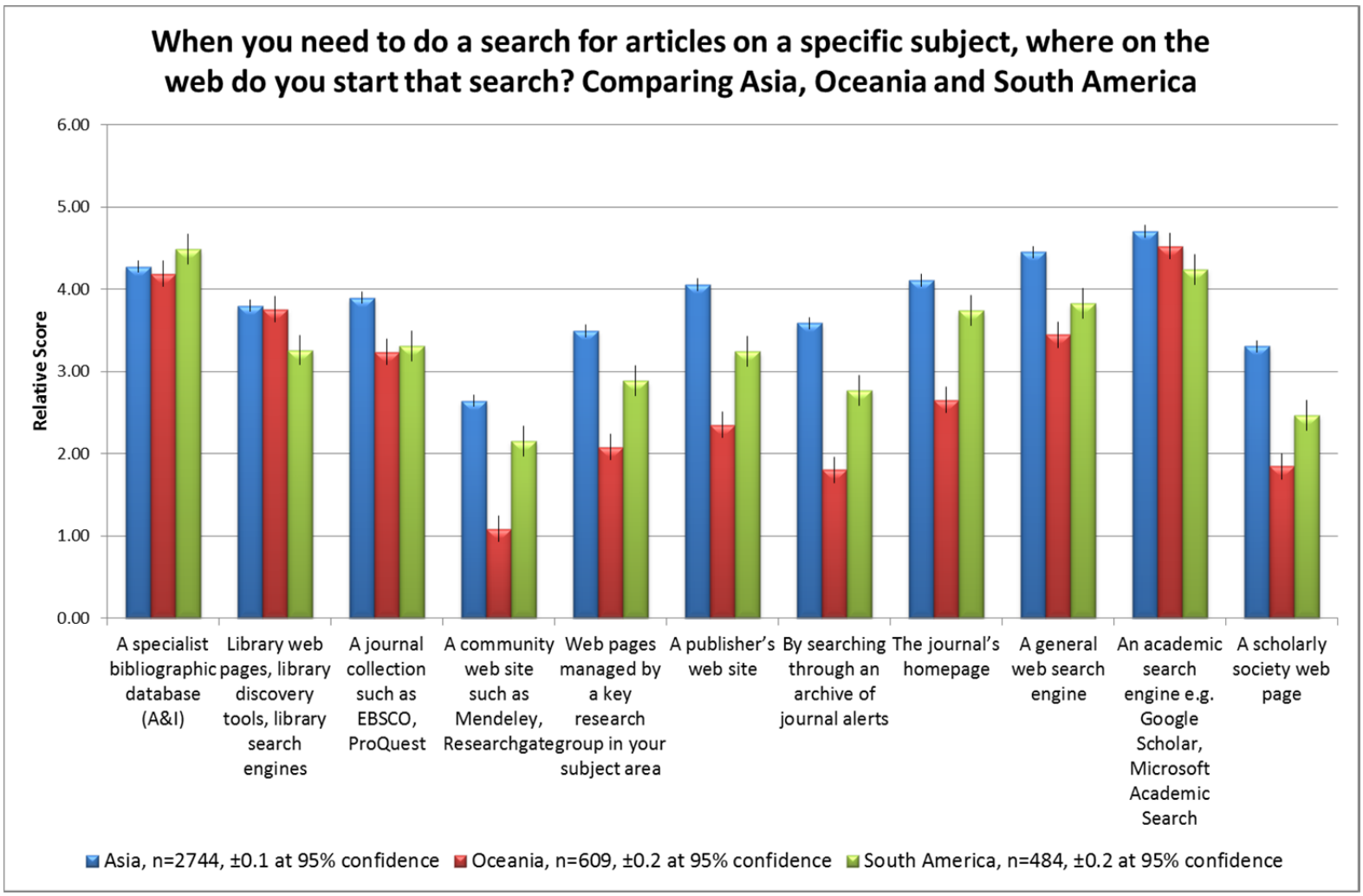


***Figure 32***

This graphs shows that Asian readers say they make more use of a wider range of discovery tools than those in Oceania and South America, just as we found with citation and browse behaviours. Readers in Oceania generally rate everything less than their South American counterparts, apart from Library web pages, where usage is on a par with Asia, journal collections, which is on a par with South America, and academic search engines where use is slightly higher than in South America, although allowing for a margin

of error this difference is only indicative. Use of community web sites, research group pages, publisher web site, journal alerts, journals home page and society web pages is significantly less than their Asian and South American counterparts.

In overall terms, Asian readers value everything fairly highly apart from research group web pages where use of this resource over all regions is relatively low. Their favourite resources are academic search engines, search engines and the journal's home page and publisher website.

Readers in Oceania value academic search engines and A&I databases over everything else and they use a general search engine less than their library web pages. Use of all other resources is generally low in this region.

Readers in South America value A&I services the most followed by academic search engines, then general search engine and journal home page. Use of the library web page in this region is much lower and is on a par with a journal collection and a publisher web site.

 

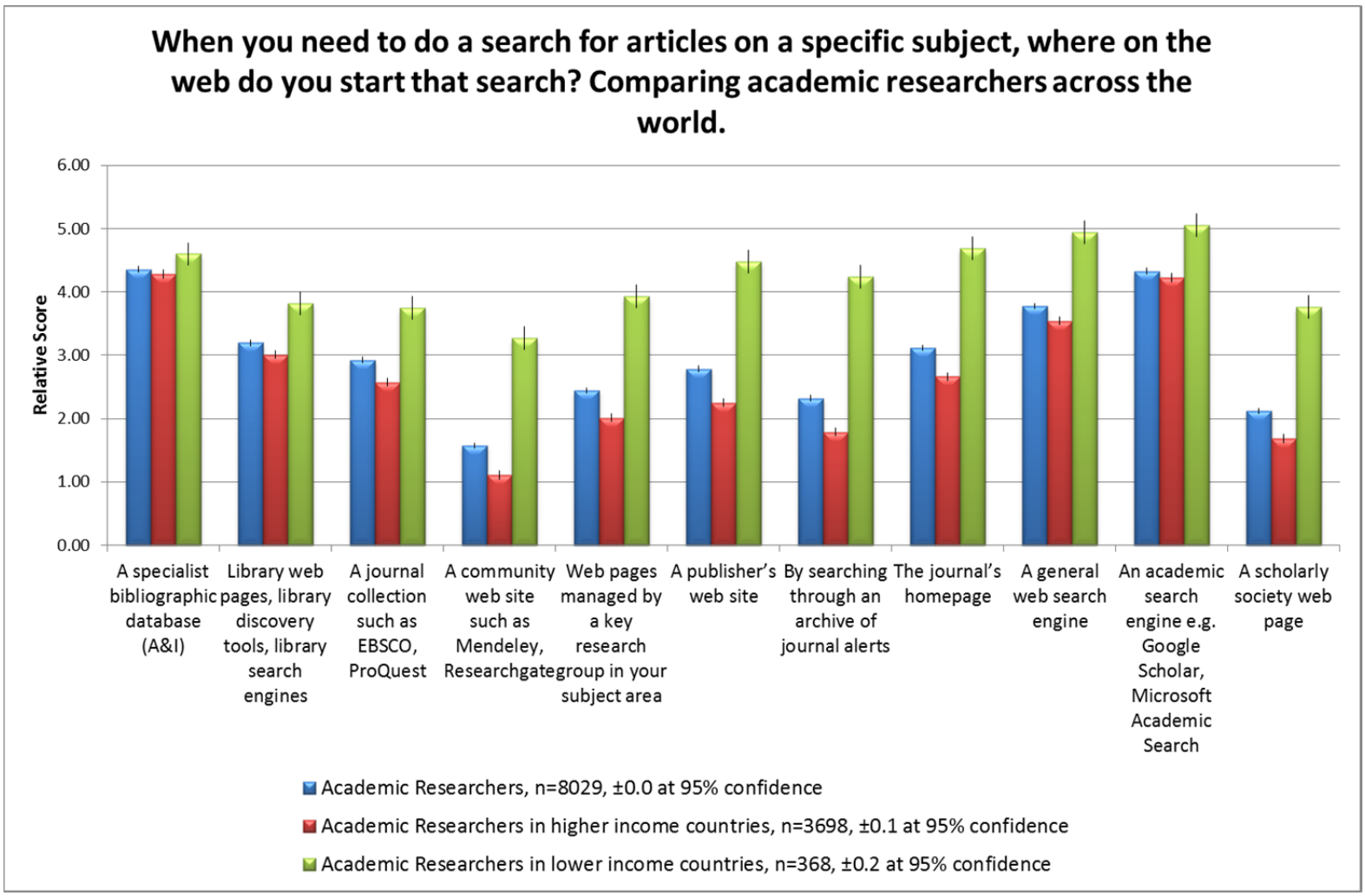


*Figure 33*

This chart shows that generally lower income country researchers have ranked everything more highly than their higher-income-country counterparts. The only resource they don't use significantly more is A&I databases. For this reason, in many subsequent analyses we compare only the higher income country outcomes.

Overall, academic search engines and general search engines are the most used resources in lower income countries. A&I use, however, is on a par with the journal's home page and the publisher web site. In higher income countries the most used resource is A&I databases followed closely by academic search engines. Use of general search engines is the third most popular resource. Popularity of community sites and journal alerts in this mode is relatively low for higher income countries.

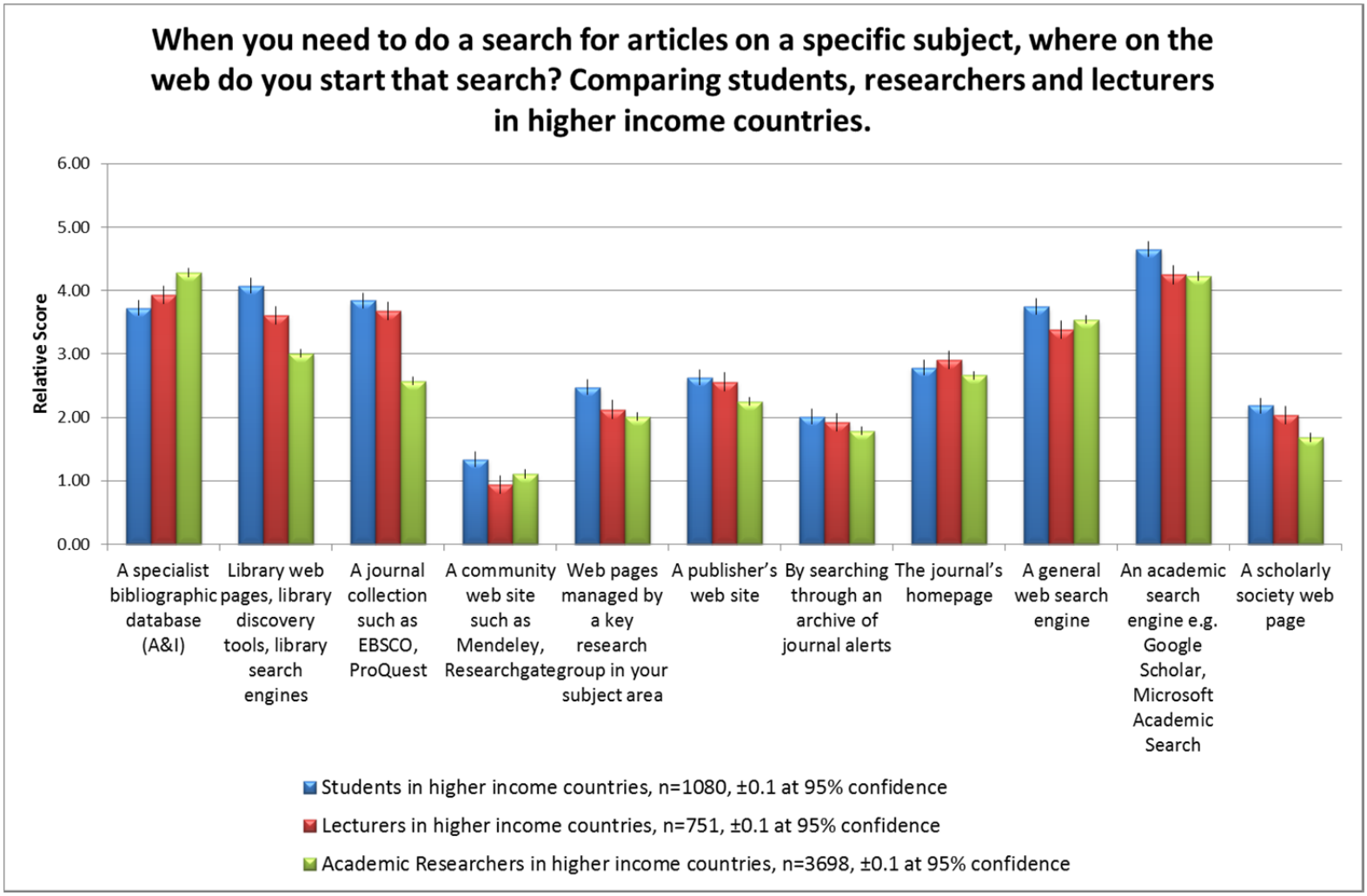


***Figure 34***

Perhaps unsurprisingly, A&I databases are most used by academic researchers followed by lecturers then students. Academic search engines are most used by students followed by lecturers and academic researchers, where use is on a par. Academic researchers use library web pages and journal collections significantly less than lecturers and students, and society and publisher web pages slightly less.

Library web pages are most used by students, followed by lecturers, and the use of journal collections, publisher's web sites and journal home pages are used a similar amount by these two groups, which is perhaps not surprising as lecturers will be using these resources to build course notes and reading lists and are likely to use them as reference points in the notes. Use of community web sites and journal alerts is low for all of these groups in high income countries.

 

In overall terms, students use academic search engines the most followed by library web pages and journal collections. Use of A&I databases and general search engines are next and on a par with each other.

Lecturers use academic search engines followed by A&I databases, Library web pages and journal collections as their top four resources for search.

Academic researches use A&I databases followed by academic search engines and general search engines. Their use of library web pages is significantly lower than general search engines.

## SUBJECT AREA COMPARISONS

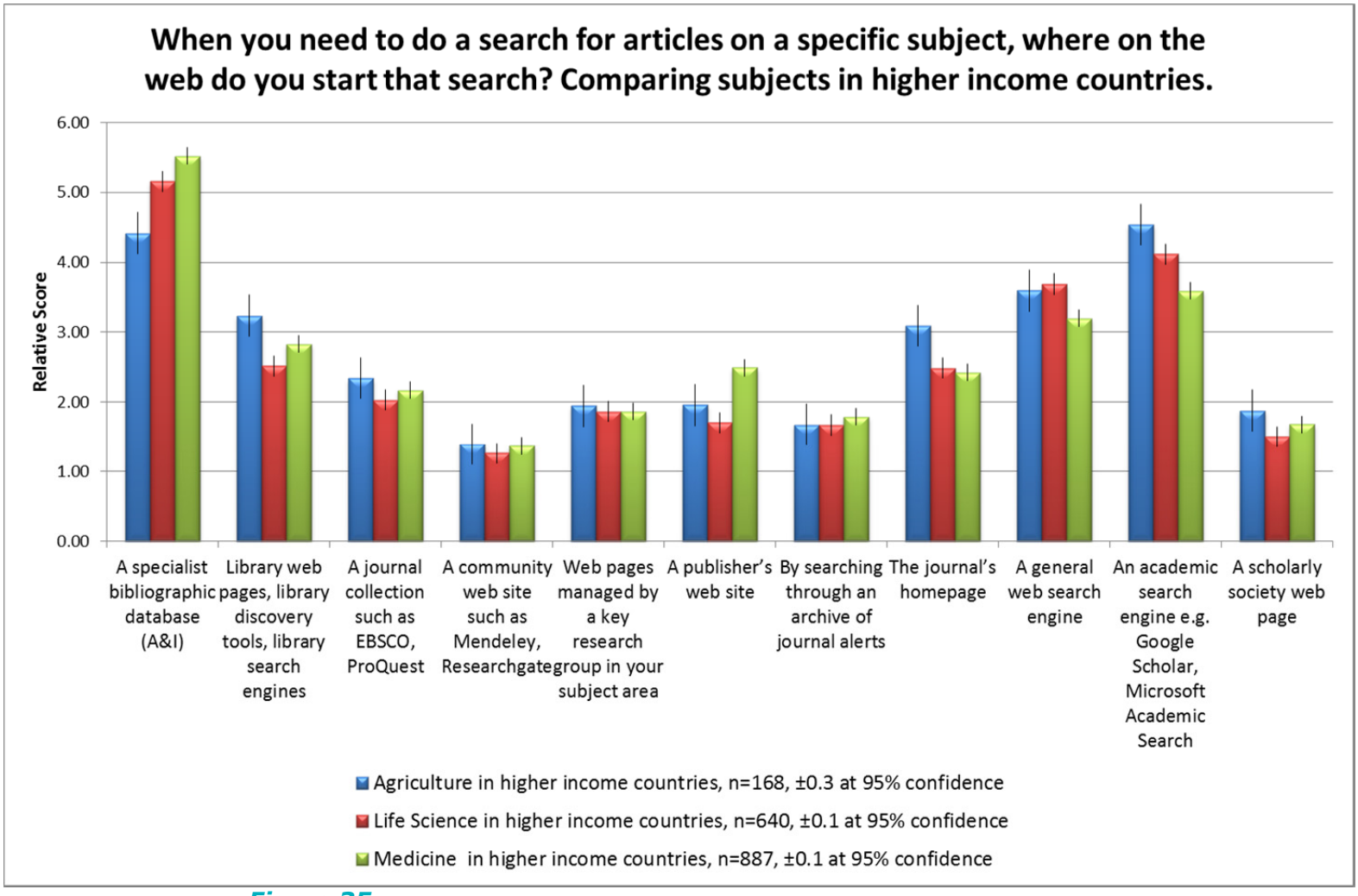


***Figure 35***

When looking at the responses by subject area, the graph shows very different results once again. The difference in behaviour by subject specialism is much more marked. The most popular tool for people in Medicine and Life Sciences is A&I databases where use is significantly higher

than all other resources, more so for medicine. This is perhaps because of the dominance of PubMed. In contrast people working in Agriculture use academic search engines slightly more than A&I databases. Other significant areas of difference include the use of library web pages which Agriculturists rate higher than the people in the Life Sciences and to a lesser extent people working in Medicine. People in Agriculture also rate the journal web page much higher than the other two groups of respondents, conversely people working in Medicine use the publisher web site more than Life Scientists and slightly more than people in Agriculture.

Overall people in Medicine use A&I services significantly more than all the others followed by academic search engines, general search engines and then library web pages. People in Life Sciences follow a similar pattern, although they use library web pages much less than the other groups. The pattern for Agriculture is different, in that they use academic search followed by A&I databases, general search engines and then journals home page and library web pages, where use is very similar. Use of all other resources not previously mentioned including journal collections is relatively low in these three subject areas.

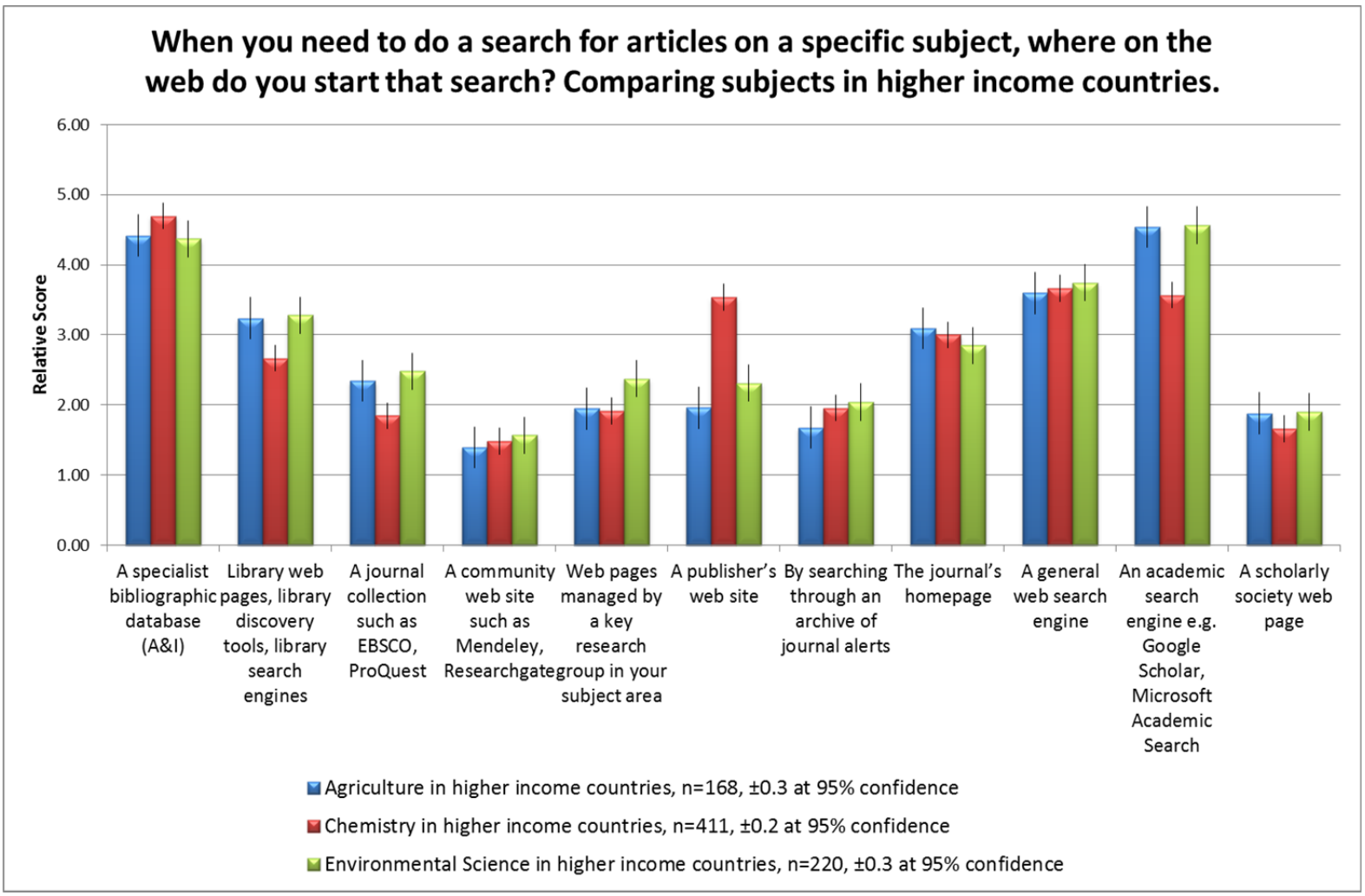


*Figure 36*

This graph shows us that people in Agriculture and Environmental Science have very similar behaviour patterns and they both use academic search engines the most, in significant contrast to Chemists. People in Chemistry use A&I databases the most followed by a general search engine and a publisher web site, where use is significantly higher than for people in Agriculture and Environmental Science. This may be because Chemistry publishers have been much more effective at marketing their brands than publishers in other subject areas. Chemists also seem to buck the trend, as their use of a general search engine is on a par with an academic search engine.

## Subject Area Breakdowns in Search

The following charts are a breakdown of the results of the question "*When you need to do a search for articles on a specific subject, where on the web do you start that search*", by subject, on a question category by category, for example, just the answers to the use of aggregations in search, broken

down by subject. In addition to that we have applied a further demographic. In terms of calculating error margins for such a plot, each subject breakdown will have a range of applicable sample numbers, *n*, and so will each of the demographic breakdowns, and as such we have used the worst case error margin for the entire series, rather than for each category. This means that for the smallest value of *n* in each chart, the error bars are accurately calculated, but where the sample is larger, the error bars have been overstated. The reader can therefore treat those results for which *n* is greater than the minimum with more confidence than the others. For example, since the total number of respondents in Earth Science and Environmental Science is relatively low, the error bars on these data points are large, but are then carried through to those subject areas with much greater response rates, such as Humanities and Life Sciences. Therefore the errors quoted in the latter subject breakdowns are overstated. Even without this allowance, the observations made below carry significance.

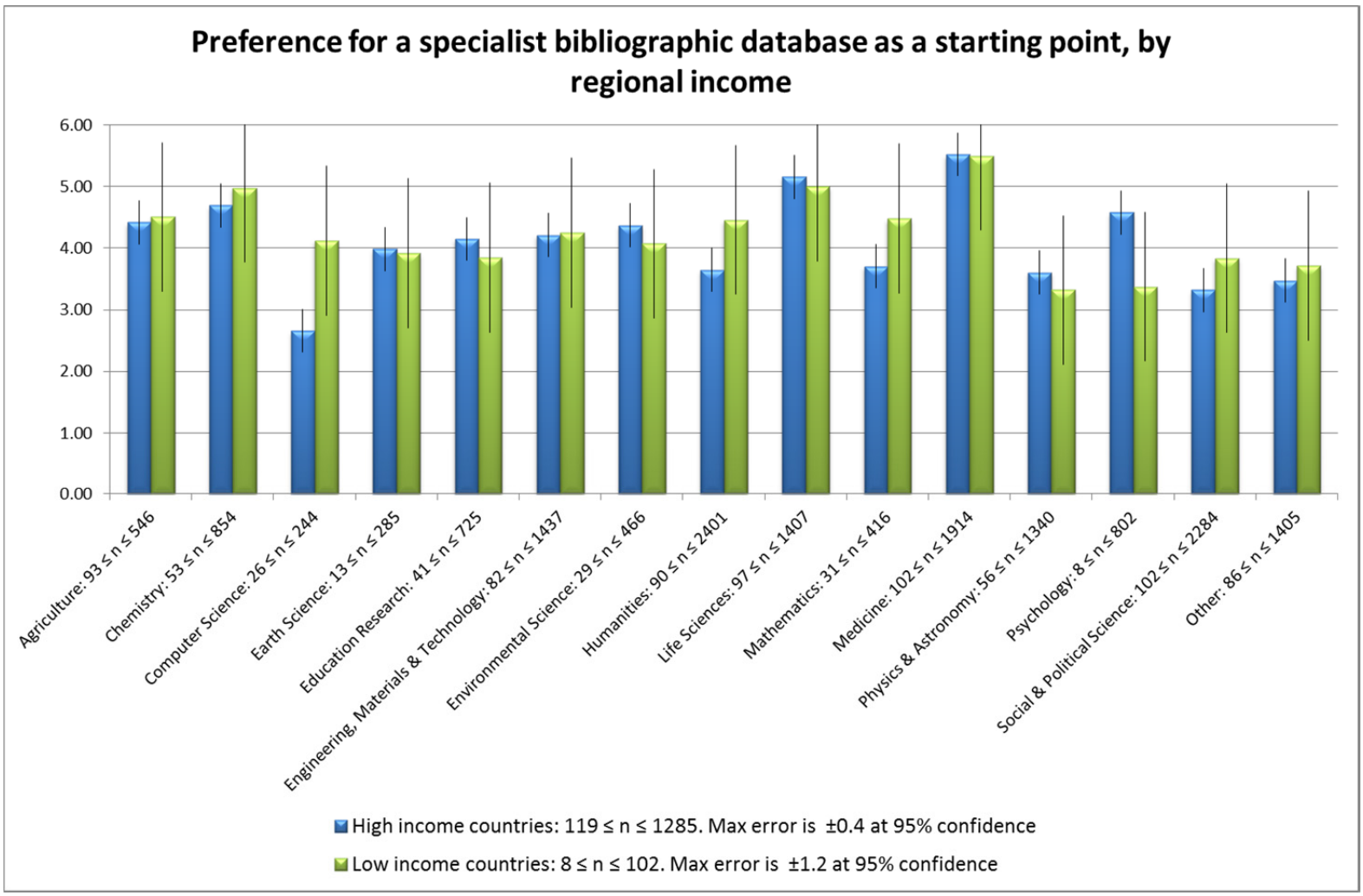


***Figure 37***

There is very little difference in the preference for an A&I database as a starting point for search behaviour across subject areas in higher and lower income countries. There is an indicative result that people in Medicine followed by Life Sciences and then Chemistry value it the most in both income groups.

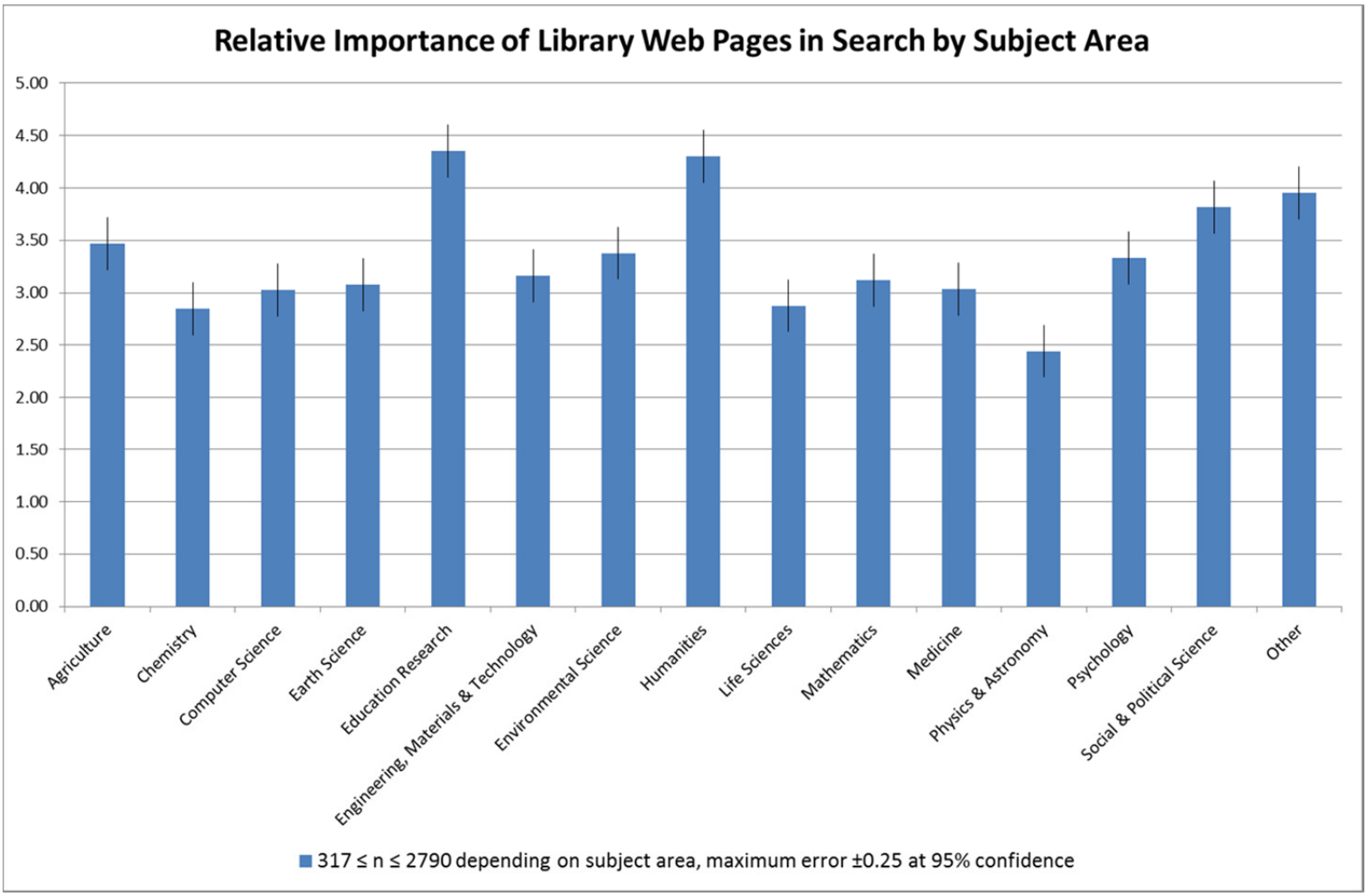


***Figure 38***

Library web pages are of most importance to people working in Education Research and Humanities followed by Social and Political Science and Agriculture. Respondents in Physics valued library web pages a lot less than many other subject areas by quite a significant margin.

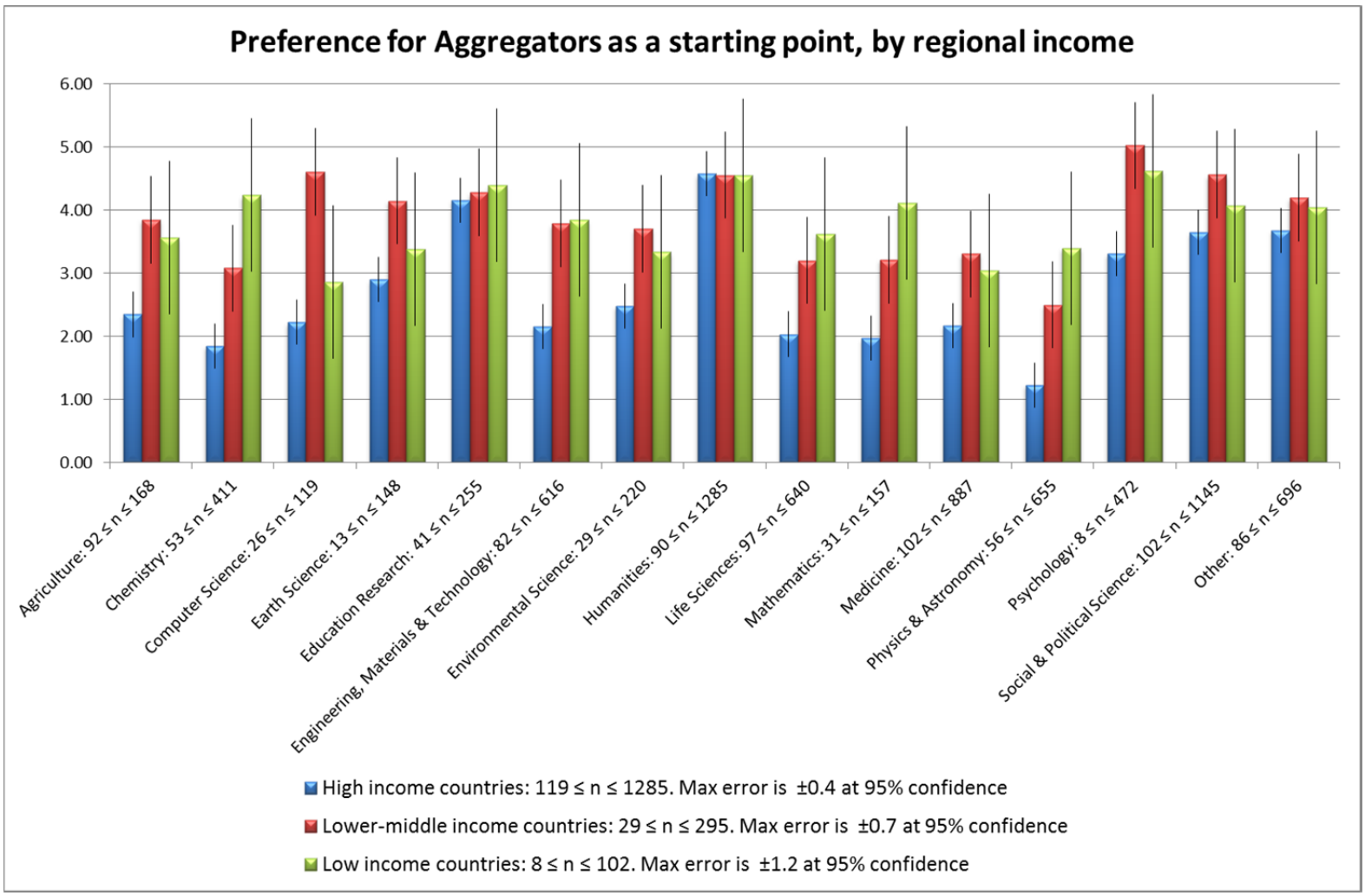


*Figure 39*

Even with the relatively large error bars that this approach gives, we still see a significant difference in the use of aggregator databases for search in high income countries for a number of subjects, including Chemistry, Engineering, Life Sciences, Mathematics and Physics. Other differences may be considered as indicative. Education Research and Humanities are shown to be similar.

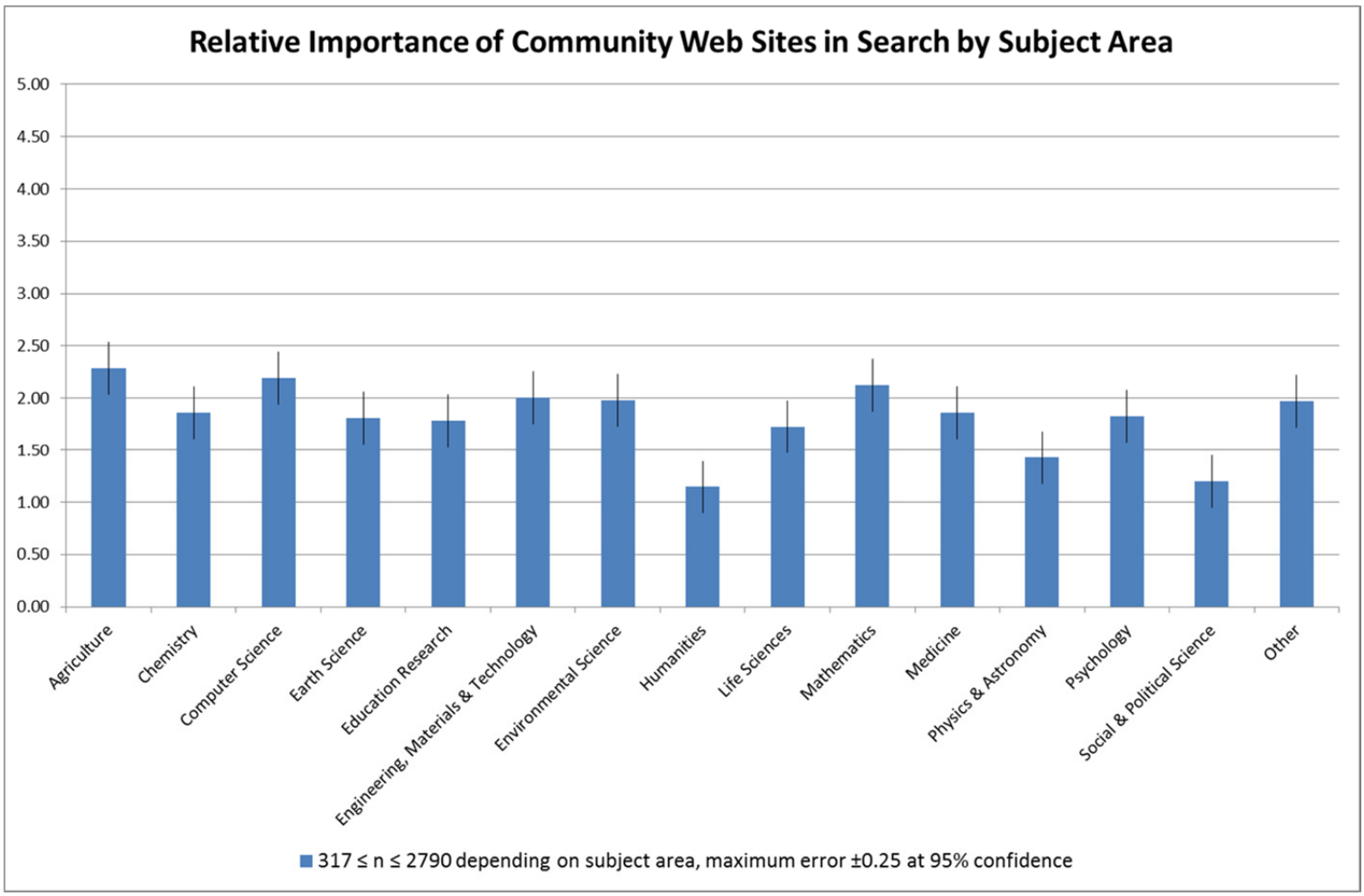


***Figure 40***

Community web sites are generally valued less than many other types of resources but it is interesting to see which subject groups value them the most. Computer Science, Agriculture and Mathematics seem to make the most use of them but it could be that these type of resources are still relatively new and people are trying to work out how best to use them.

 

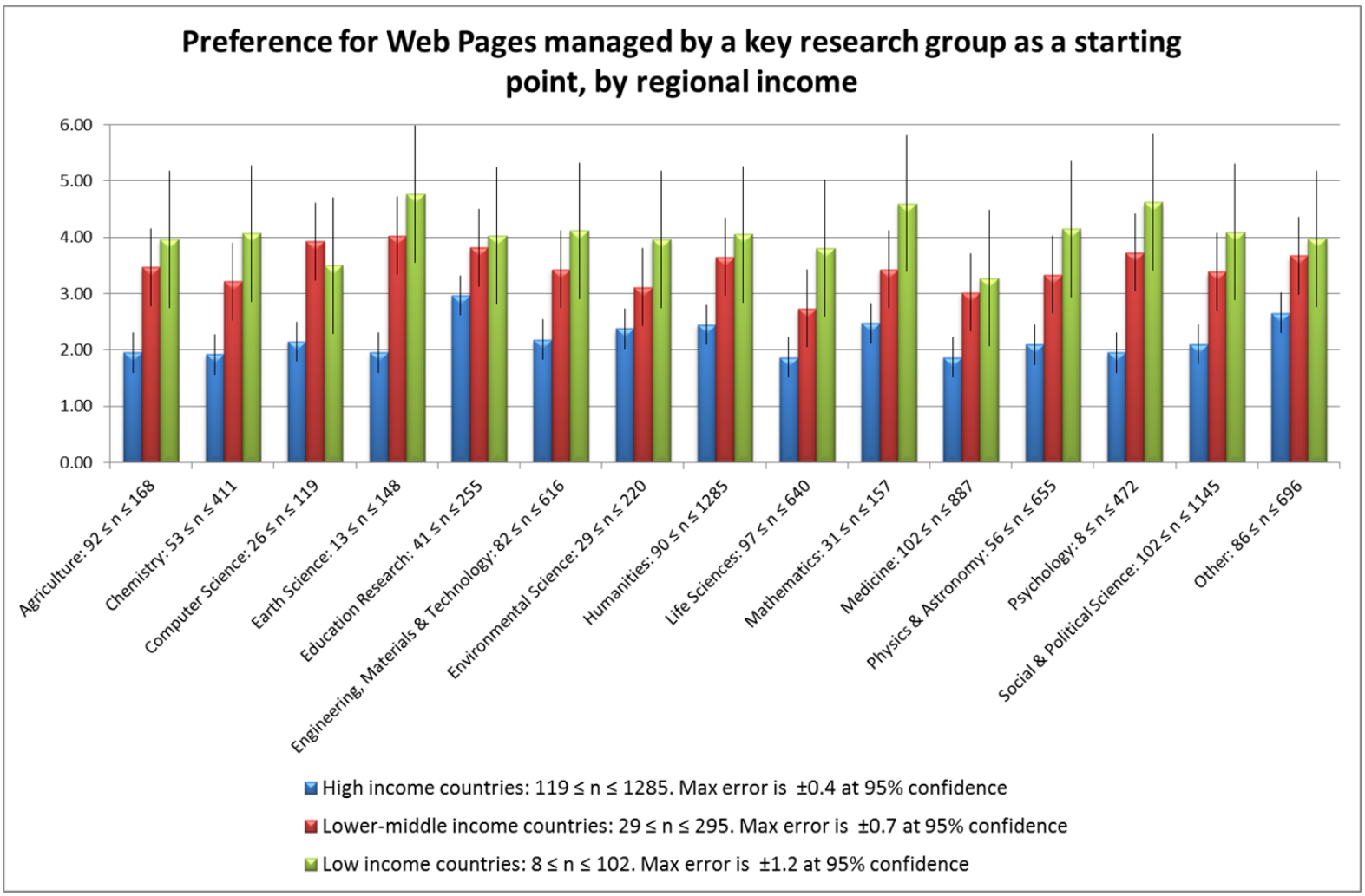


*Figure 41*

Key research group web pages are more important in lower income countries than higher income countries as a starting point for search. The results may indicate that people in Earth Science, Psychology and Mathematics in lower income countries make the most use of them, although with such large ranges for error, this should be taken only as an indicative result. Alternatively respondents in Education Research in higher income countries value them more than most other subjects and there is an indicative result that people in Computer Science in lower-middle income countries value them more than both of the other income groups, the only subject area where this is the case.

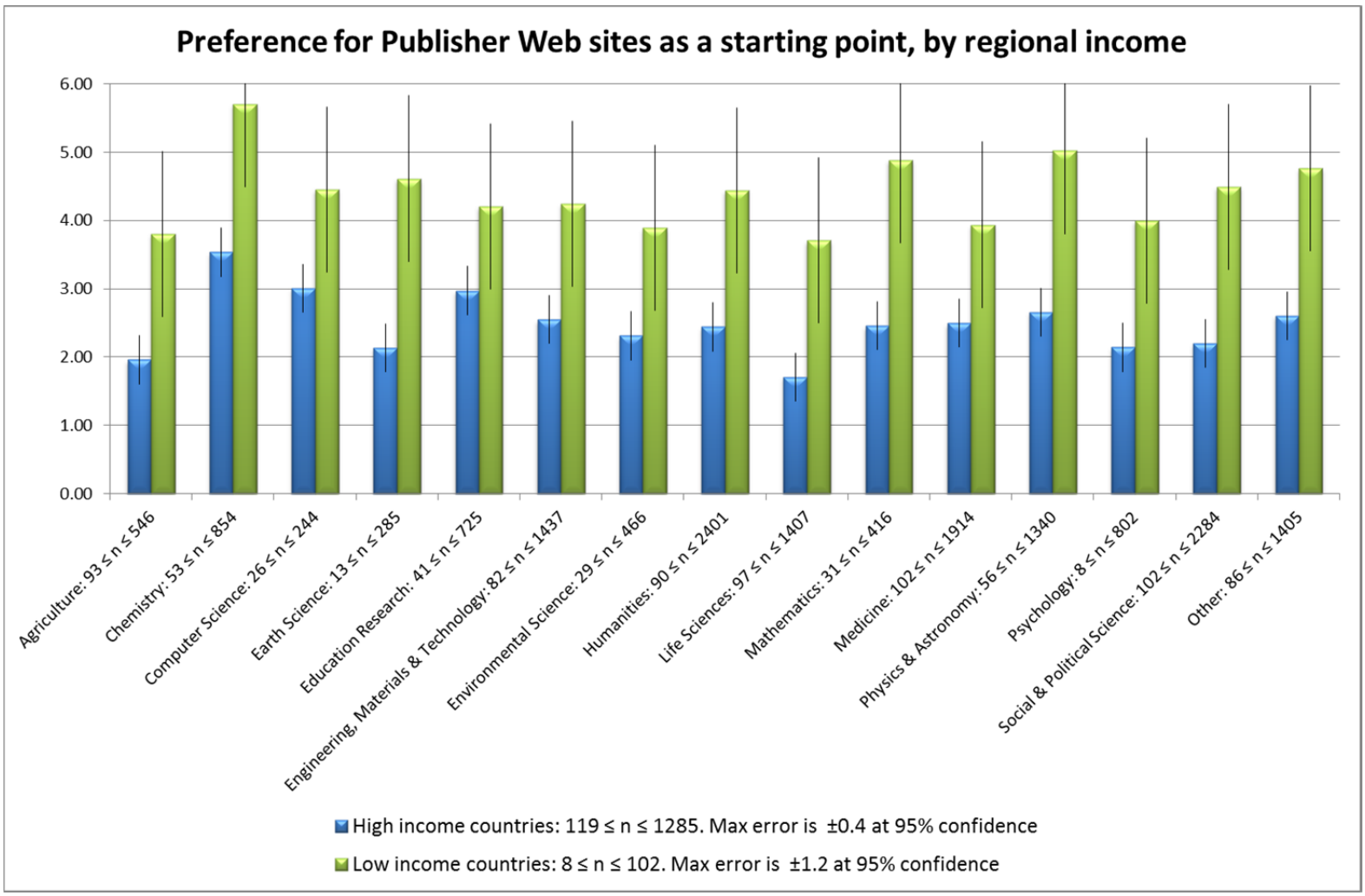


***Figure 42***

In general, readers from lower income countries make more use of search functions within publisher web sites, possibly due to the cost of using subscription based A&I databases. In Life Sciences, Medicine and Agriculture respondents have a lower differential and lower absolute scores, presumably due to the availability of PubMed as a search option instead. There is an indicative result that the top three users of publisher web sites in lower income countries are people in Chemistry, Physics and Astronomy and Mathematics compared to Chemistry, Computer Science and Education Research in high income countries.

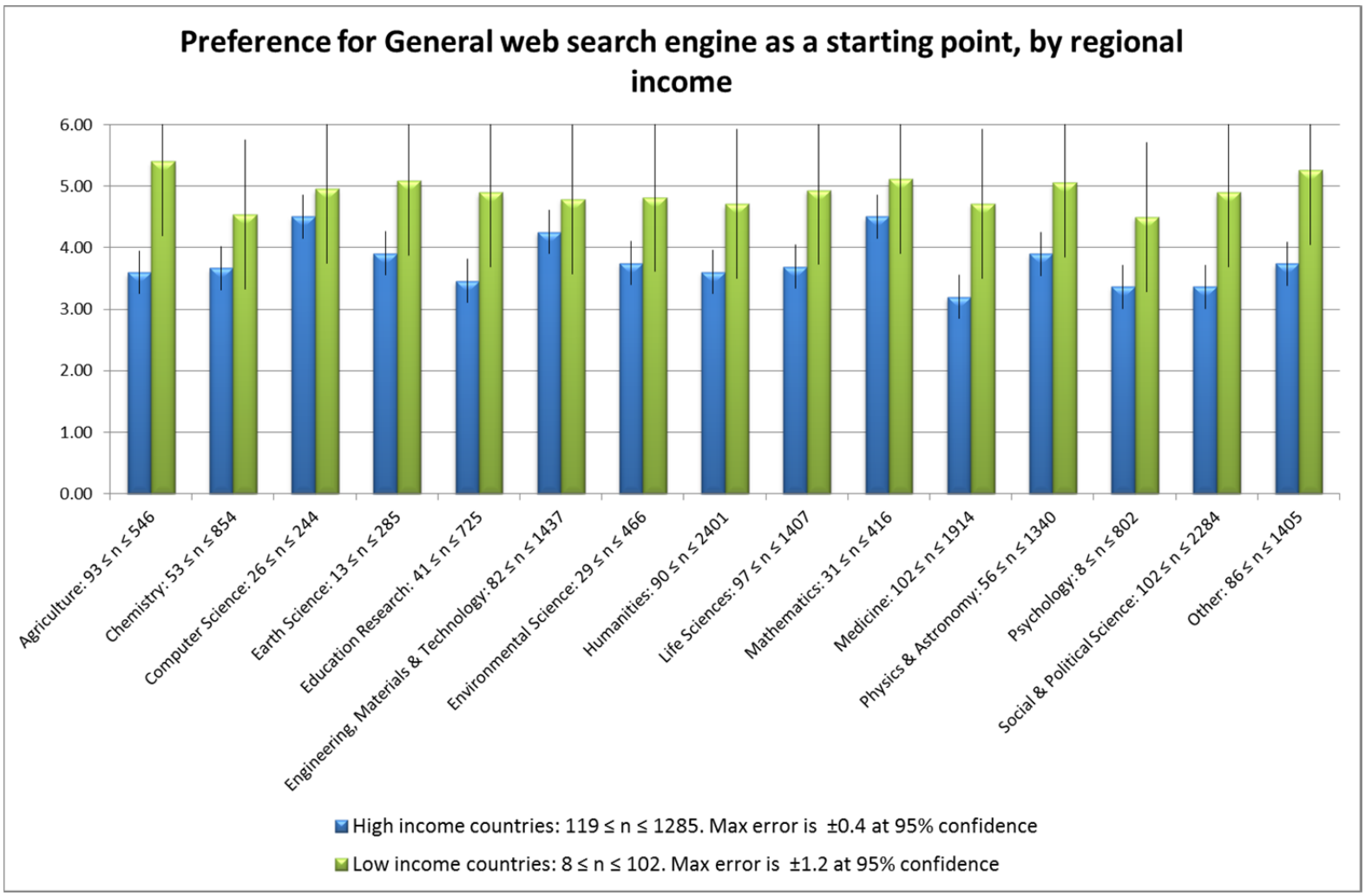


*Figure 43*

Perhaps unsurprisingly this graph shows that use of search engines is high across all subjects and income brackets; however there is an indicative result here that people in poorer countries value it more (but this is shown more concretely in other results in this section). Respondents in Chemistry and Psychology use it the least in low income countries and in Medicine in high income countries but, given the margin for error allowed for, these are only indicative conclusions.

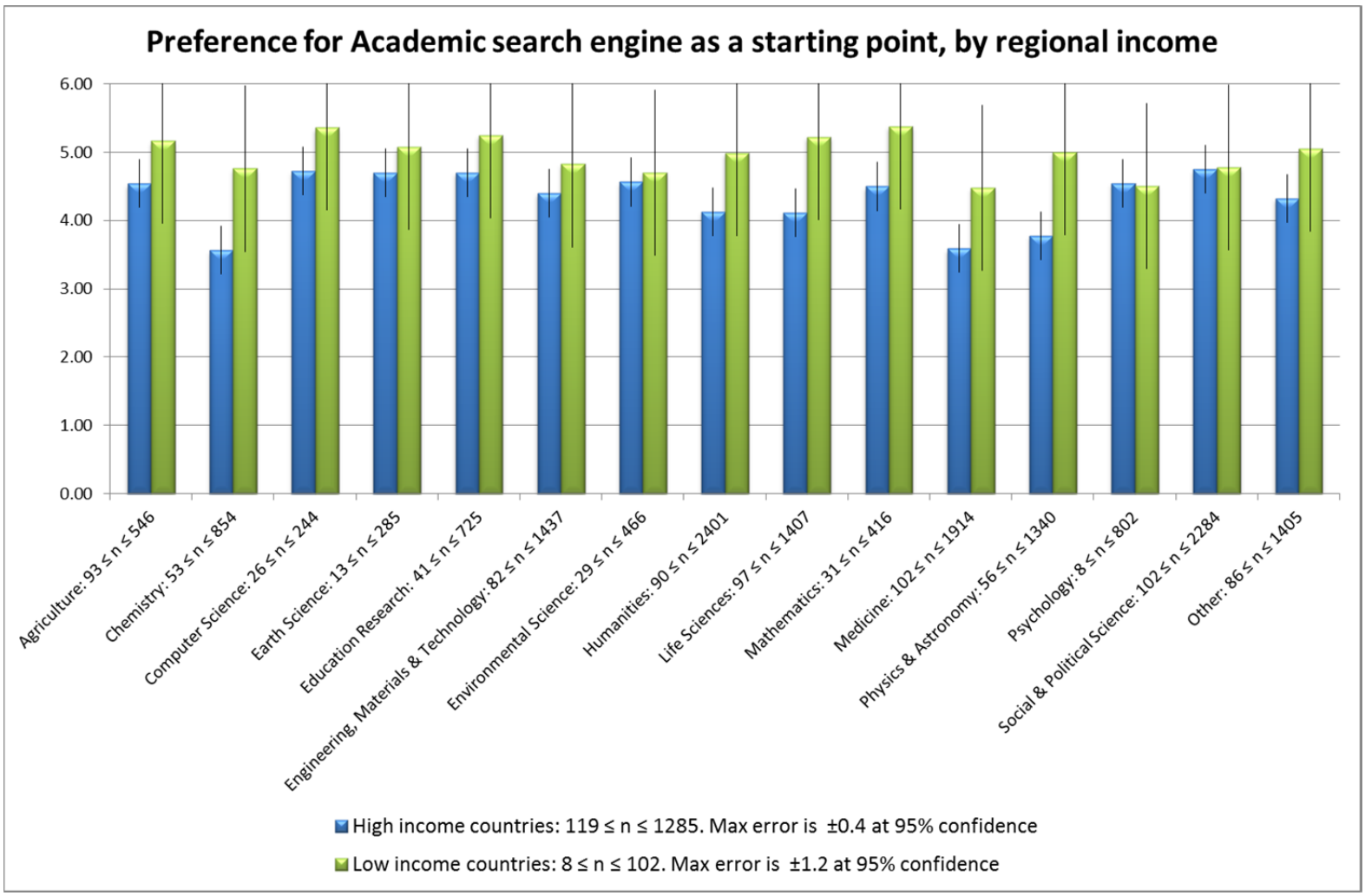


*Figure 44*

This graph perhaps shows that there is less difference between income groups for academic search engines. Medicine, Chemistry and Physics use academic search engines less than many other subject areas. One wonders whether the cause of this is better specialist search, more access to that specialist search or that Google has a broader index of relevant material than does Google Scholar.

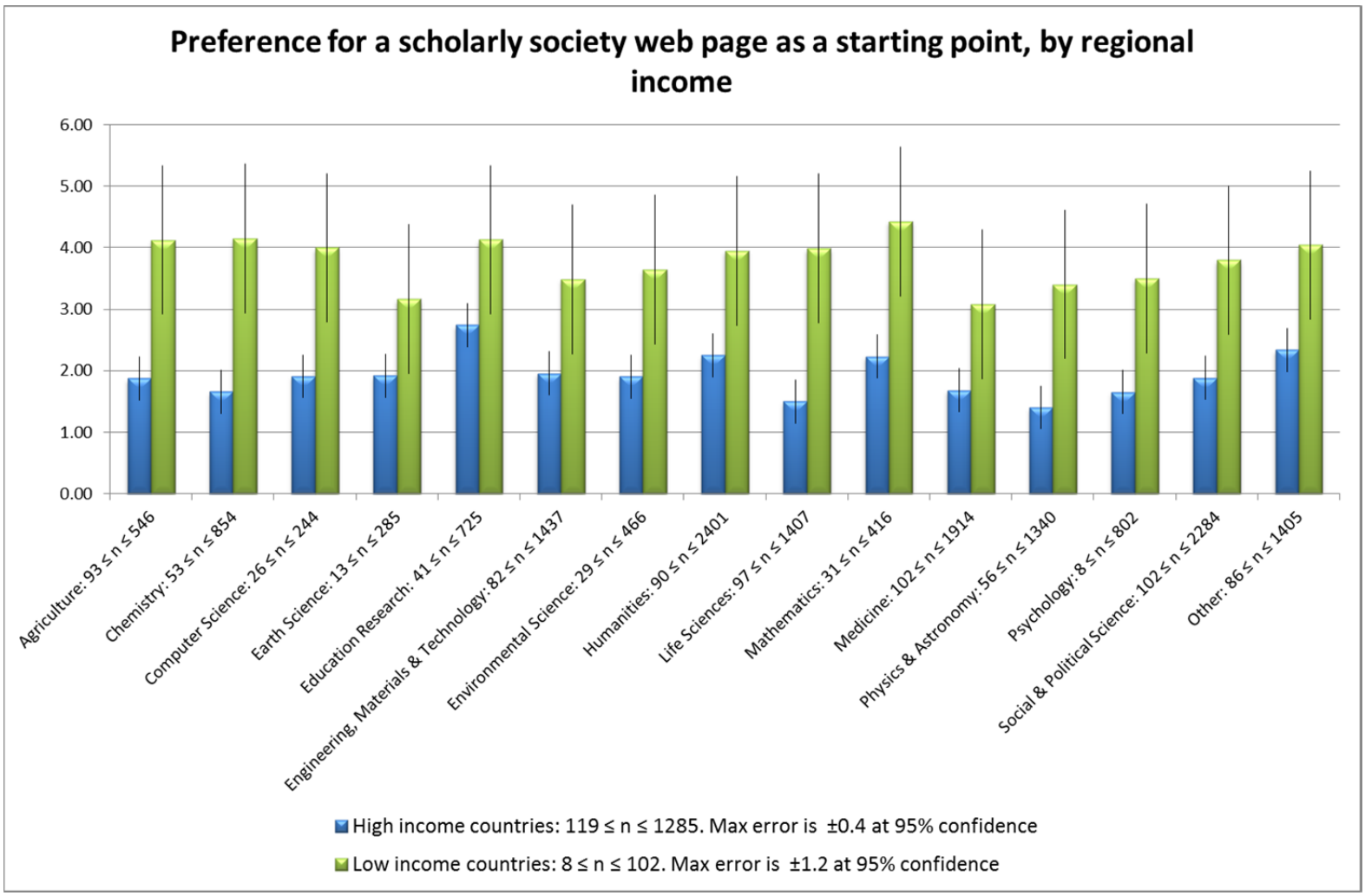


***Figure 45***

This graph shows us that readers in lower income countries make significantly more use of society web pages in search, as with all the other measures we have studied. There is an indicative result that Medicine and Earth Science in low income countries make the least use of society web pages in this way. In higher income countries we can see that Physics and Life Sciences make significantly less use of society web pages than many other subject areas.

## COMMENTS

ArXiv was also rated as extremely important for a number of Physics and Mathematics researchers. PubMed was also a noted resource with respondents saying that they valued it from across the subject areas, especially in Medicine unsurprisingly. Two respondents in Chemistry mentioned that PubMed was their first point of call.

Some respondents mentioned they ask their librarians, friends or *"a colleague on the corridor".* Some respondents are also suffering from information overload *"I do not have access to some of those mentioned (at least I don't know I have: a main problem is that there are simply too many to follow and too many ways to follow!)"* – Respondent in medicine. One respondent in the "other" subject category commented that *"I hadn't heard about Google Scholar before this survey, but I'll check it out now. Thanks!"* The comments show that while very many of the respondents are well versed on all the types of discovery resources, there are also many who appear not to be - it could be assumed there is a vast difference in the knowledge and understanding of how best to access the content they need. Other people still do not appear to be engaged with online discovery at all *"I only use online sources when I'm desperate",* respondent in social and political sciences.

## MOST RECENT ARTICLE ACCESSED

With the luxury of such a large number of responses to the survey, it is also a useful check to ask how readers discovered the very last article that they accessed. This is useful since in part it can validate their previous answers about the relative importance of various starting points, but also indicates which modes of use they are more commonly in. It is common to imagine that most people are in search mode more than in browse mode, or in following-up-on-a-citation mode.

In this question we asked respondents:

*For the last online journal article you accessed, were you:*

- *Reading an article recommended to you on email?*
- *Reading an article posted by a colleague on Facebook, Mendeley, or other social networking site?*
- *Reading an article in a journal you have bookmarked?*
- *Following a link from a journal issue/topic alert?*
- *Following a link from a saved search alert?*
- *Searching for articles on a subject?*
- *Following up an article citation from any other source?*
- *I can't remember (or not applicable)*

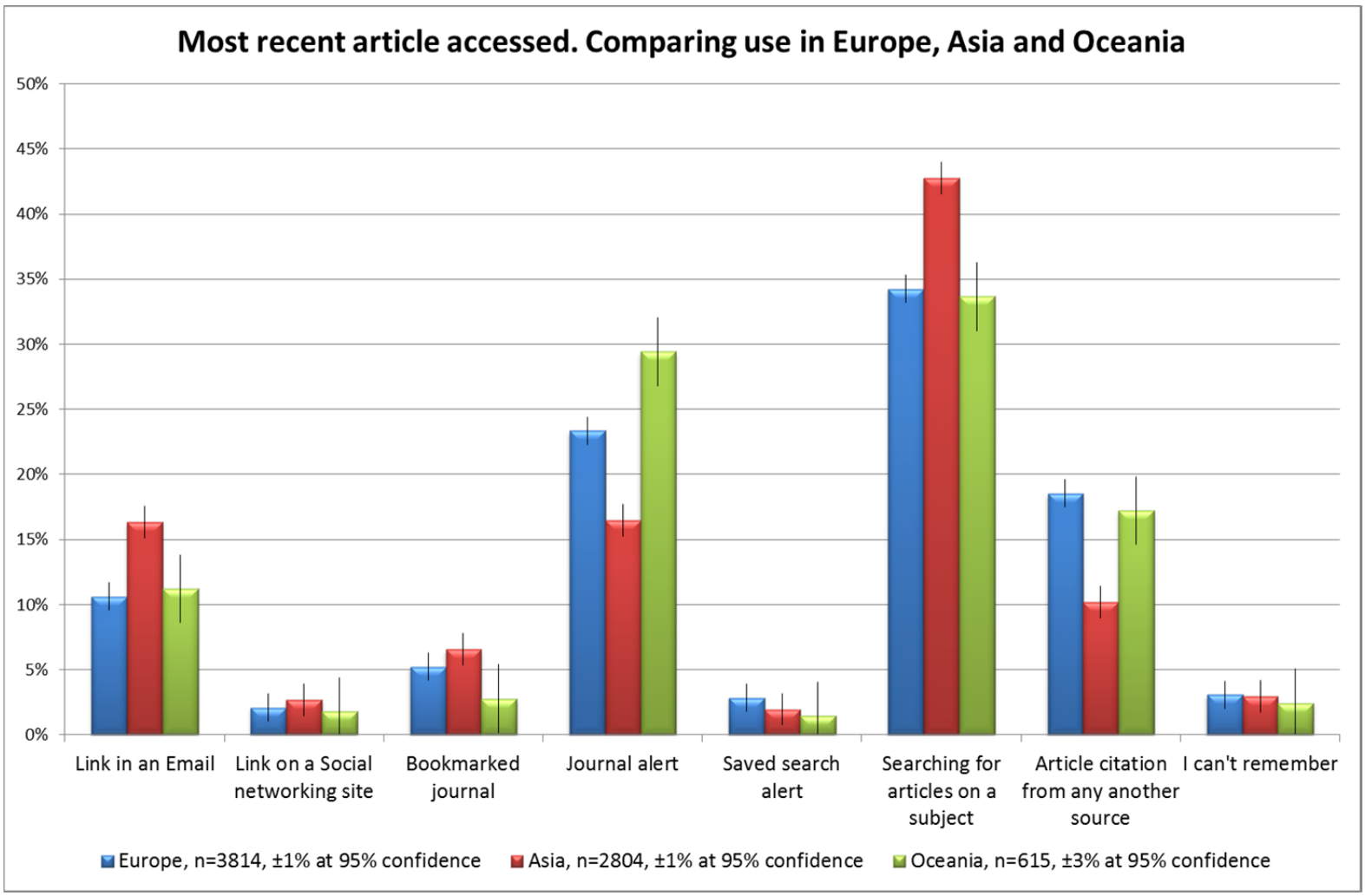


*Figure 46*

This result appears to show that respondents in Asia spend much more time in search mode than reading content from journal alerts, although they also seem to make more use of article recommendations in emails than their European and North American counterparts. Journal alerts are most popular in Oceania.

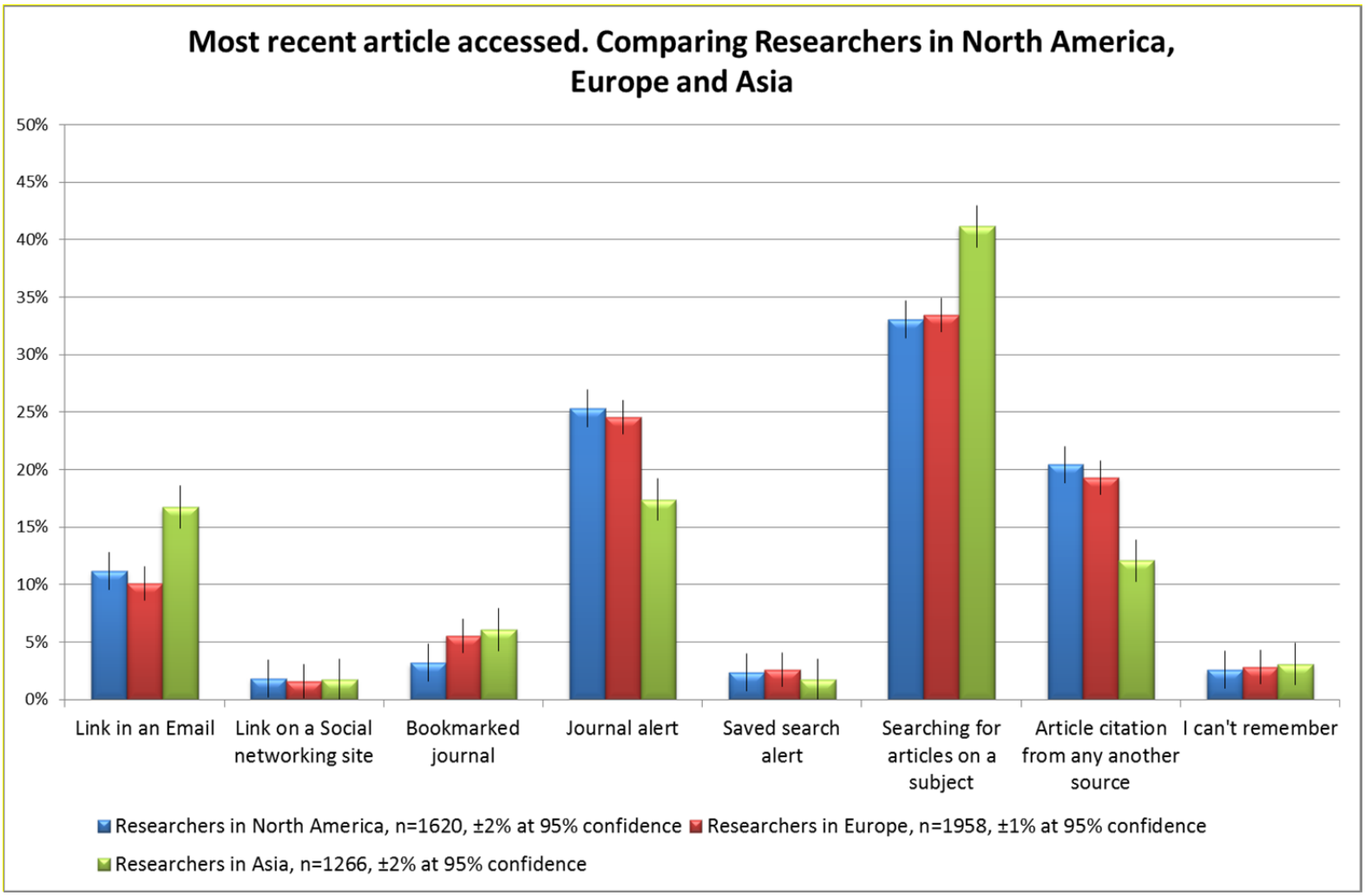


***Figure 47***

This graph compares behaviour from Academic Researchers in North America, Europe and Asia and shows that Asian researchers are much more likely to be searching for articles than anything else, and much more likely to be doing so than their European and North American counterparts. Links in emails are also more frequently used by Asian researchers than those from North America and Europe. There is no notable difference in the behaviour of academic researchers in Europe and North America. The majority of researchers in both regions say they were searching for articles when they last accessed an article. However, journal alerts are also well used, as are article citations from other sources. Social networking links, journal bookmarks and saved search alerts are not used frequently by researchers in any of these three regions.

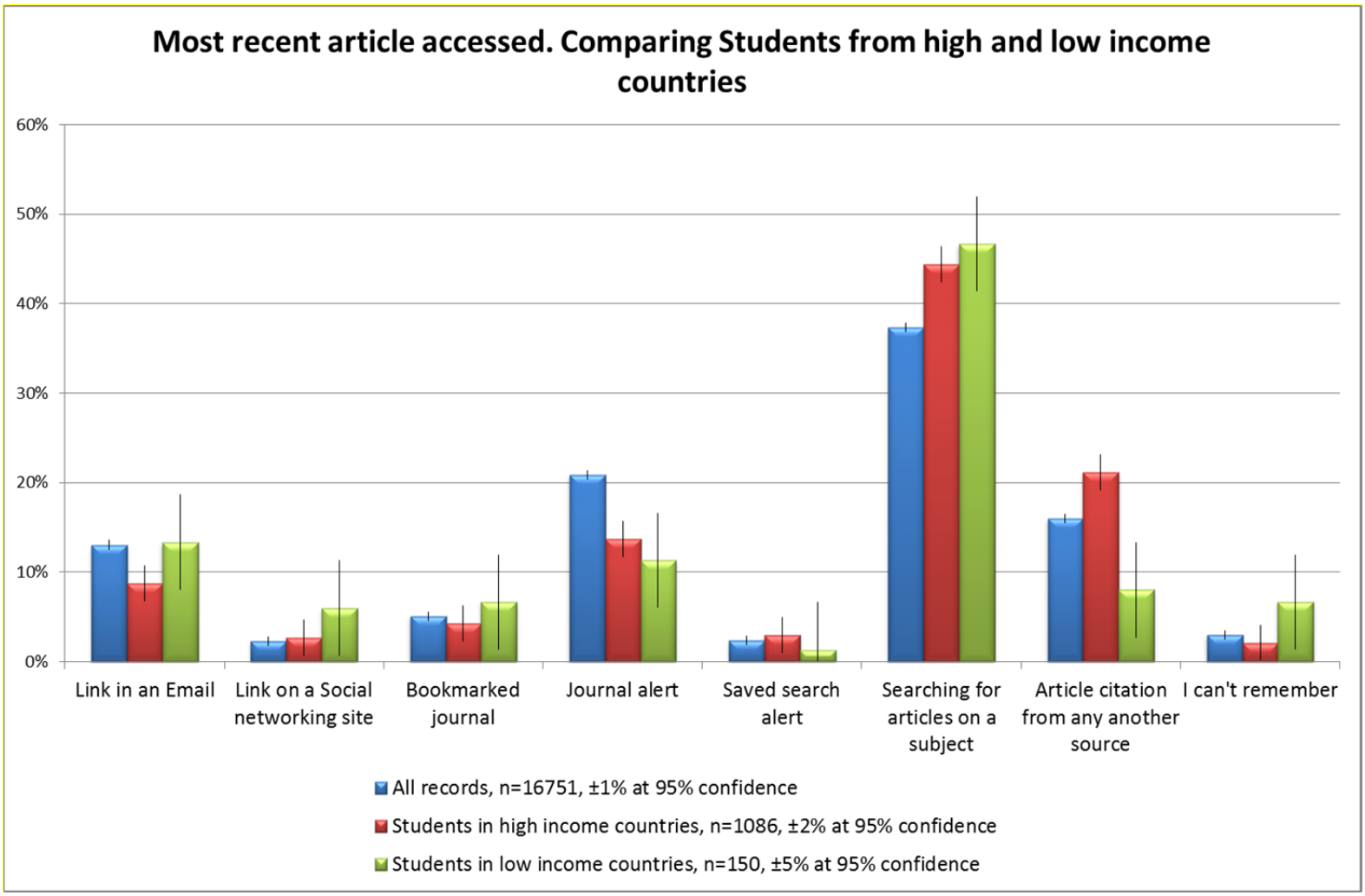


*Figure 48*

Once again, searching for articles is the most frequently used activity and there is no notable difference between students in high or low income countries here. Article citations from other sources are used more by students in higher income countries, presumably reflecting reading lists.

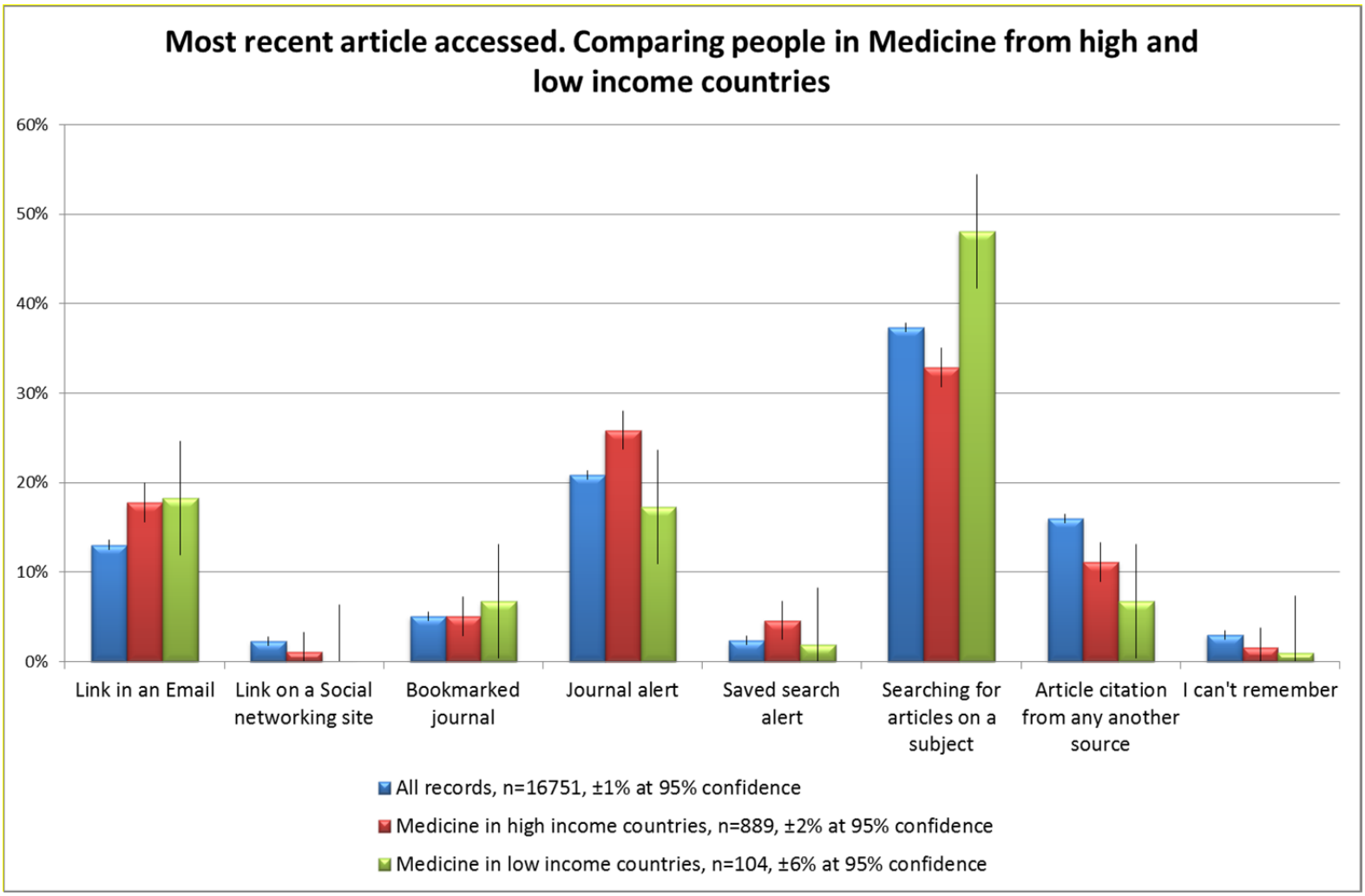


*Figure 49*

This graph breaks down the previous data even more to look at people in Medicine from high and low income countries. There is a large difference here from the previous graph in that journal alerts are much more frequently used by people in Medicine in high income countries than other countries – they are nearly as frequently used as by people searching for articles on a subject. Those in Medicine in lower income countries are mostly searching for articles on a subject.

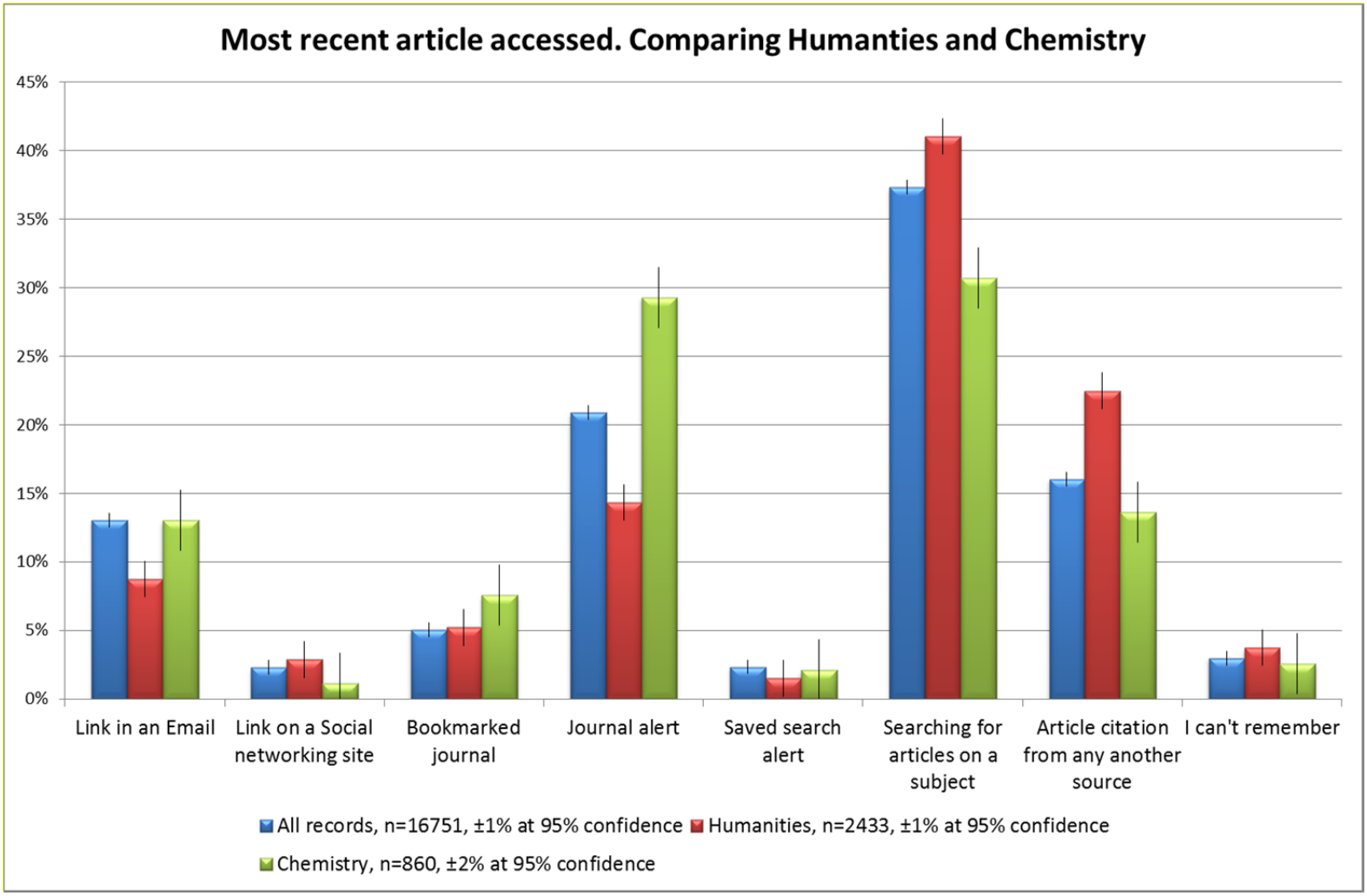


***Figure 50***

Journal alerts are extremely important to those in Chemistry. This graph shows that they are just as important as searching when accessing articles. Conversely, journal alerts are not very important to those in Humanities, and article citations are much more important to this group than everything bar searching, and much more important to them than to the people in Chemistry.

 

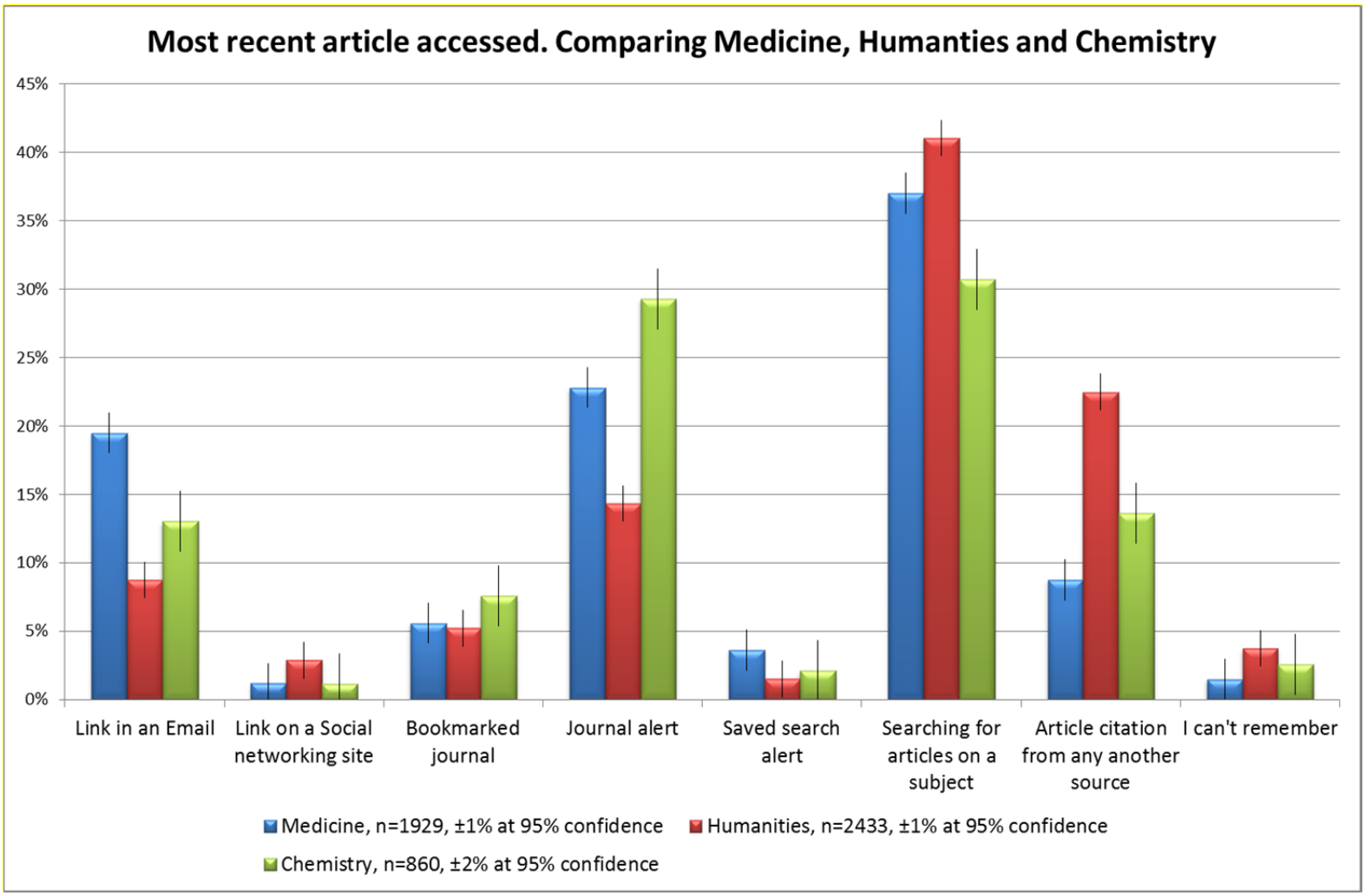


***Figure 51***

This graph adds Medicine to the comparison to see where that fits in and we can see that links in emails are more frequently used by those in Medicine than the other subject areas. Journal alerts are also important to those in Medicine but not quite so much as people in Chemistry.

 

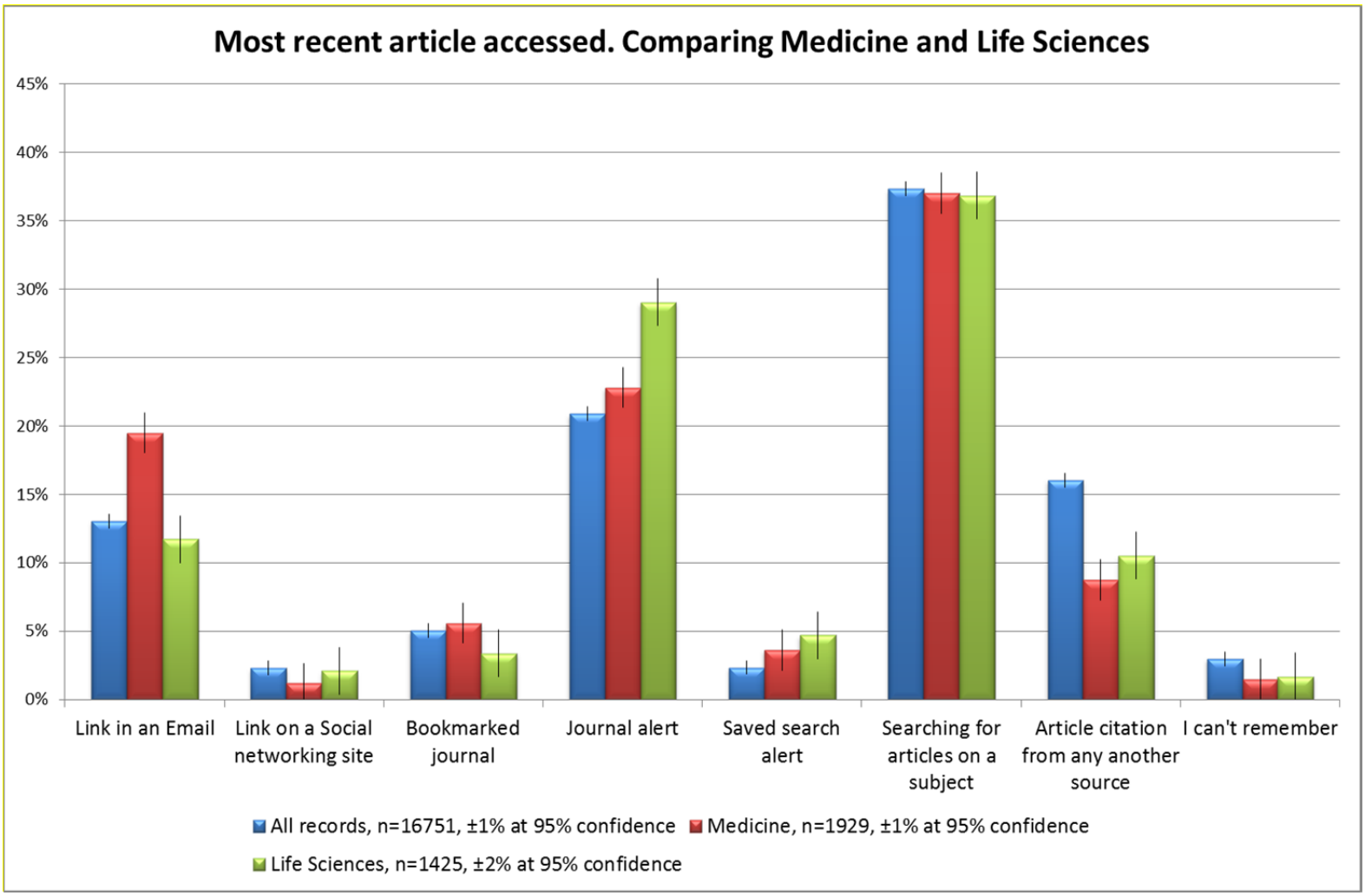


*Figure 52*

When we then compare Life Sciences with Medicine, two subject areas you might think are quite similar, we see that that searching is equally as important to both groups but journal alerts are much more important to those in Life Sciences. Peer recommendation through links in emails is significantly more important for those in Medicine over the Life Scientists.

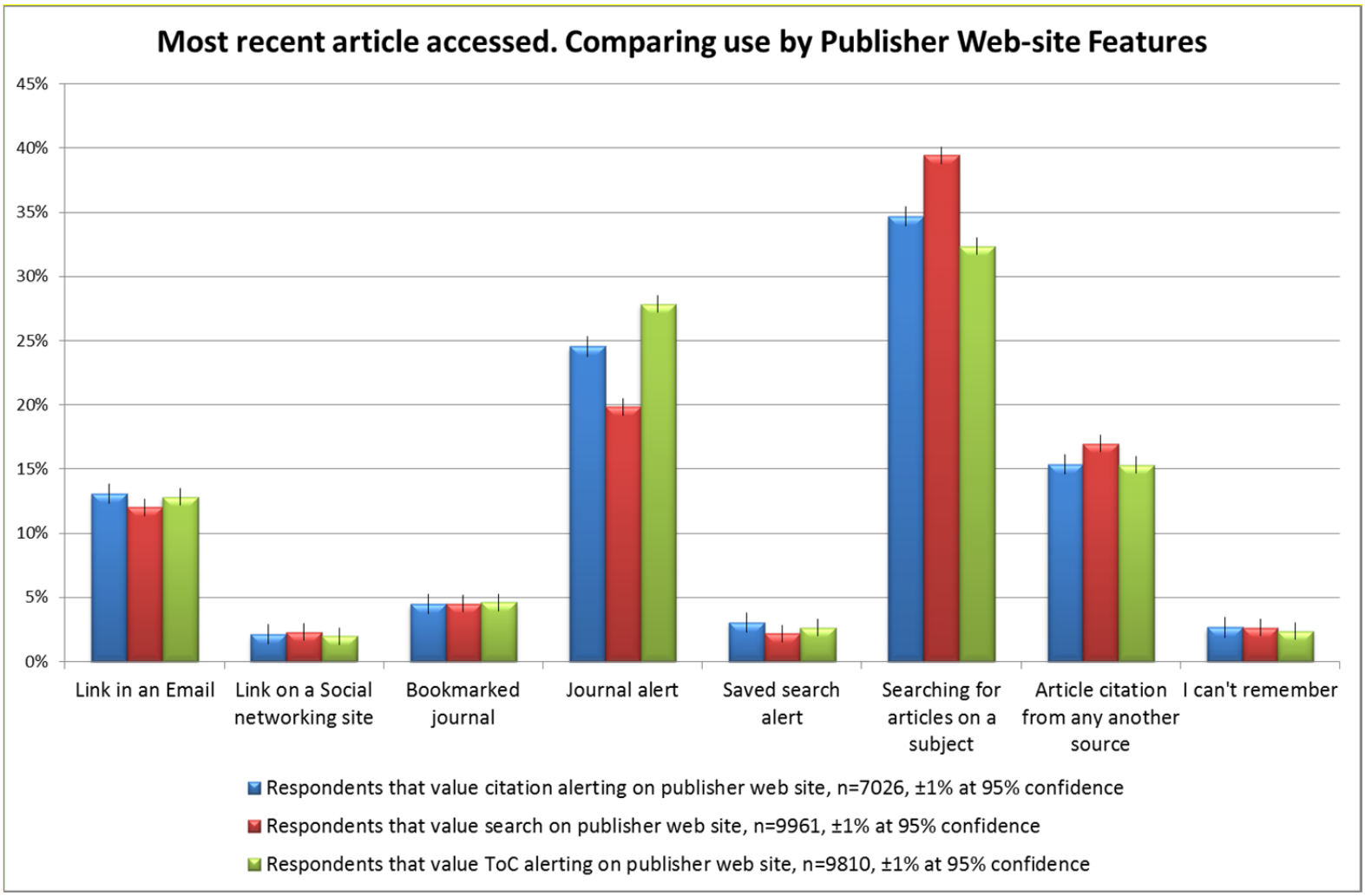


***Figure 53***

This chart shows that respondents who said that they used various alerting services on publisher web sites do also access more journal content in this way.

Similarly, those who said they value search services on a publisher web site access more journal content through search.

# Discovery Resource Conclusions

## Abstracting and Indexing services (specialist bibliographic databases)

A&Is are seen to be the most important starting point for many subject areas across many sectors in search, and also an increasingly common way of following up on a known citation. The trend since 2005 is positive in all three modes of use studied, although some subject areas are much better served than others. From the comments made, PubMed is such a popular resource in Life Sciences and Medicine that many respondents could hardly imagine any other means of search in their disciplines. When looking at a subject breakdown, people in Medicine, Life Sciences and Chemistry rate them most highly, whilst people in Computer Science classify them as much less important.

## Library web pages (previously Library OPAC)

Investment in library technology seems to be having a positive impact on the use of library web pages in search, while as a means of viewing the most recent articles in a subject niche, popularity remains flat. Readers seem to be turning away from these resources as a means of following up on a citation. In absolute terms we know that library web pages are less important than other discovery sites, but with web scale discovery being in its early days of reader adoption, and such positive impact on usage being widely reported, the upward trend for search on these platforms should be watched with interest. Currently those working in Humanities, Social and Political Science, and Education Research rank library web pages most highly whilst those working in Physics and Astronomy classify them as less important.

## A journal collection, or aggregation (new in this survey)

Journal aggregations overall are important, but not as important as many other discovery methods, until one starts to look into some subject disciplines (Humanities, Social Sciences) and particular demographics (students, lecturers) where they are more popular. They are also much more popular in the lower income countries.

### A COMMUNITY WEB SITE (NEW IN THIS SURVEY)

Across the board, community web sites such as Mendeley and Researchgate are used much less than other starting points for all three behaviours. This could be because they are relatively new and have yet to build up the brand recognition and penetration needed to compete with some of the other resources. It appears that community websites are more heavily used in lower income regions such as Asia, Africa and South America. Apart from regionally there is currently little difference in how they are rated across any of the demographic breakdowns.

### WEB PAGES MANAGED BY A KEY RESEARCH GROUP

Key research groups are also used less than other starting points, although they are more important than community web sites. This could be because they generally appeal to smaller subject niches so when we look at the results more broadly, they are relatively unimportant. However, when looking at the trend graphs, they have grown in importance for all three types of behaviours studied. Once again, respondents in lower income countries use these resources more than in higher income countries and that could be because they are largely free. In terms of demographic variances, people working in Agriculture and Education Research do tend to rate these resources more highly than people in other subject areas.

### A PUBLISHER'S WEB SITE

A publisher's web site has become more important for looking at latest articles in core journals over time. For the other two types of behaviours their importance has remained static. Publishers' web sites tend to me more heavily used in lower income countries, presumably because they are a free resource for discovery. People working in the fields of Chemistry and Medicine tend to use publisher web sites for browsing core journals more than any other subject; they appear very important to people in these fields. It could be because a small number of publishers have dominance in these subject areas, or it could be because the publishers in these niches have done a lot more work on marketing.

## EMAIL BASED ALERTS

For all three types of behaviour, email based alerts have decreased in popularity since 2005. However, when looking at them in comparison to other resources in absolute terms they are still important for looking at the latest issues of core journals. Following the trend of the other starting points, readers in lower income countries use journal alerts more than in higher income areas and people in Chemistry use them significantly more than in other subject areas for browsing the latest articles of their core journals. This could be because many chemistry ToC alerts have become very visual (including structures and chemical equations) and are therefore more engaging and helpful.

## THE JOURNAL'S HOMEPAGE

The journal's homepage has remained important for looking up a citation; this hasn't changed over time and is as important as an academic search engine, and more important than a general search engine. It has slightly grown in popularity for discovering latest articles and searching – this could be because journal publishers are getting much better at generating journal brand awareness within their core user group. For people in Europe, the journal homepage is the most popular place for looking up a citation and for academic researchers generally it is in the top 3 most important resources for this type of activity. For discovering latest articles, the journal homepage is the most popular resource in all regions. In terms of subject breakdown, people working in Chemistry and Mathematics rate it highly. The journal homepage is less important to people when searching, as would be expected but is still more important than other resources such as community web sites and research groups.

## GENERAL WEB SEARCH ENGINES

General web search engines have grown very slightly in popularity for people looking up a citation, grown slightly more for people discovering latest articles but decreased in popularity for people searching. This could be because search engines have been separated out this year to general and academic. People in Oceania use general web search engines less than any other region for looking up a citation. People who work in Computer Science, Agriculture and Engineering use them more than other subject areas whilst

people who work in Medicine use them less – this could be because of the dominance of PubMed in this area. They are much less important across the board to people when they are discovering latest articles in higher income countries, possibly because there are more resources available to them. As for searching, general web search engines are not as popular as academic search engines, apart from in lower income countries where there is not much difference between the two.

### ACADEMIC SEARCH ENGINES (NEW FOR THIS SURVEY)

When following a citation, academic search engines are the second most popular resource across the board. They are less important for people who want to discover latest articles; they are more likely to use the journal home page, journal alerts, a publisher's web site or an A&I. When searching, an academic search engine is the second most popular resource. When looking up a citation, academic researchers, lecturers and students ranked an academic search engine highly. People working in Humanities were more likely to use their library web pages or an aggregator database, whilst people in Life Sciences and Medicine were more likely to use an A&I. It is not such an important resource for discovering latest articles and compares well with a general search engine for this type of behaviour. However, for searching for articles on a specific subject, an academic search engine is very important in all regions.

### SOCIETY WEB PAGES

Whilst still not as important as many of the resources listed, society web pages have grown in importance in all three behaviours studied. This could be because of the work done by society publishers to increase brand awareness. Once again, people in lower income countries such as Asia and Africa use them more than other regions. People working in Agriculture use them just as much as journal alerts when looking up a citation. When browsing, people in Education Research rank them slightly more highly than other subject areas.

# THE ROLE OF THE LIBRARY

Over the past fifteen years, libraries have been expending ever more time and money in the management of e-resources, and much of these efforts have been focussed on the development and implementation of library web pages, journal A to Z listings, improvements to library catalogues, library link-servers and now web scale discovery products. These web site tools are available from library technology vendors – often the same organisations responsible for the earliest library automation projects of 30-40 years ago, while others are more recent innovators in the area.

Anecdotally, the authors are aware that publishers generally have little appreciation for these technologies and yet, combined, they have a significant effect on user navigation. The KBART project, a joint project of UKSG and NISO, has started to make inroads into this lack of understanding and publishes guidelines for publishers on getting metadata into library technology systems to enhance discoverability.

Elsewhere in this report we have already seen that library web pages are a very important starting point for researchers in a number of modes of use. It is therefore essential that publishers engage with libraries and library technology companies to ensure that their content is indexed in products like web scale discovery, but also that their sites can be linked to at the article level in a predictable fashion, either by accepting an OpenURL or by having a systematic deep-linking syntax.

In addition to understanding library web pages as a starting point, the survey asked readers about the influence of library technology on navigation and the findings are shown below.

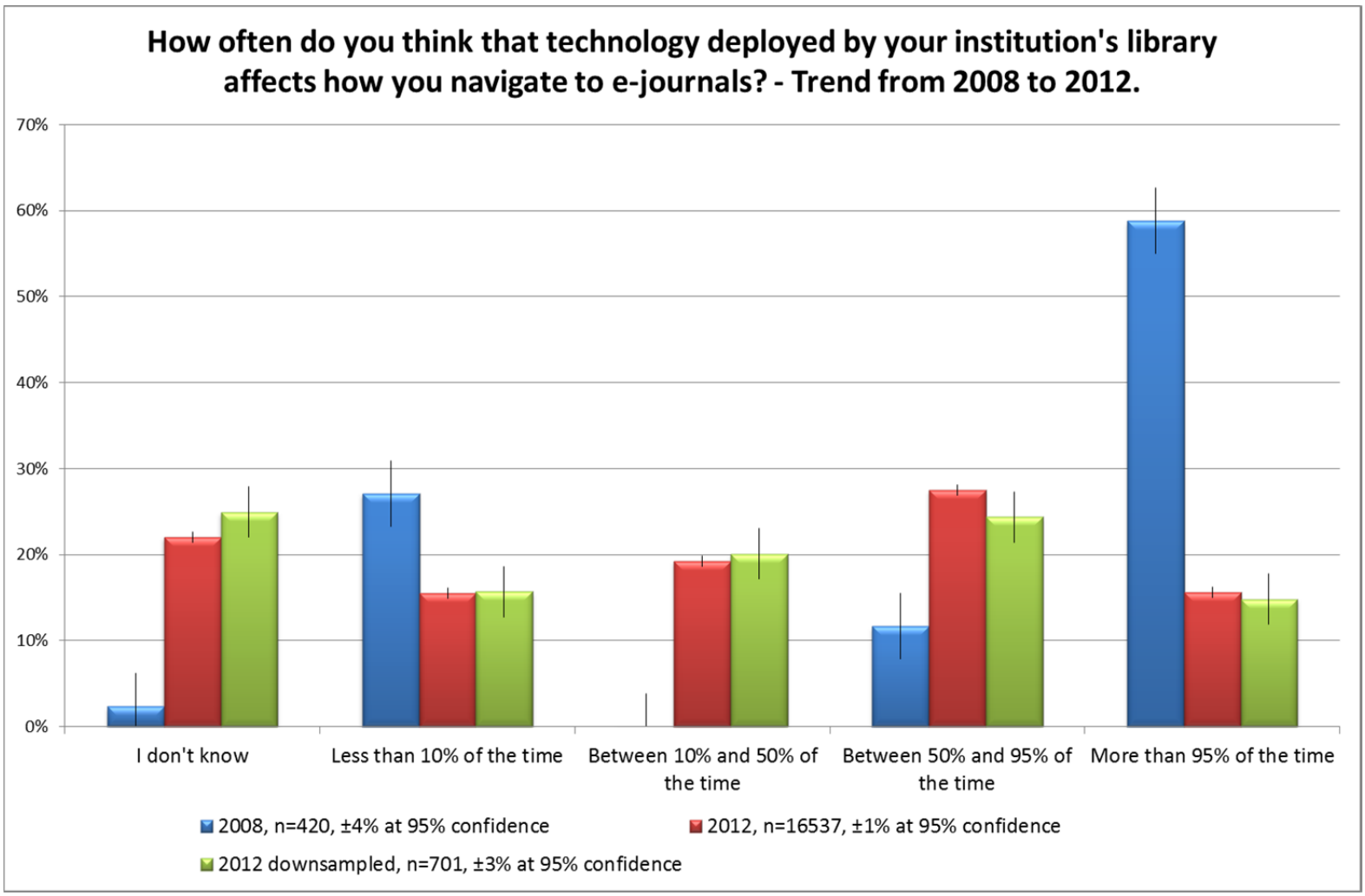


*Figure 54*

There is an enormous difference in results between 2008 and 2012. This might be that there is simply much more awareness of the role of library technology, and when it is coming into play, or that library technology has become much less obtrusive and noticeable, or that readers no longer classify much of the technology of navigation as being library-provided.

If it is true that library technology, although present, is less obtrusive than before, it is perhaps a cause for considerable concern for librarians that their efforts are not recognised or attributed to the library.

The data also shows that the down-sampled 2012 data isn't significantly different from the full data set, so we cannot infer that the difference was in any way a result of the sampling.

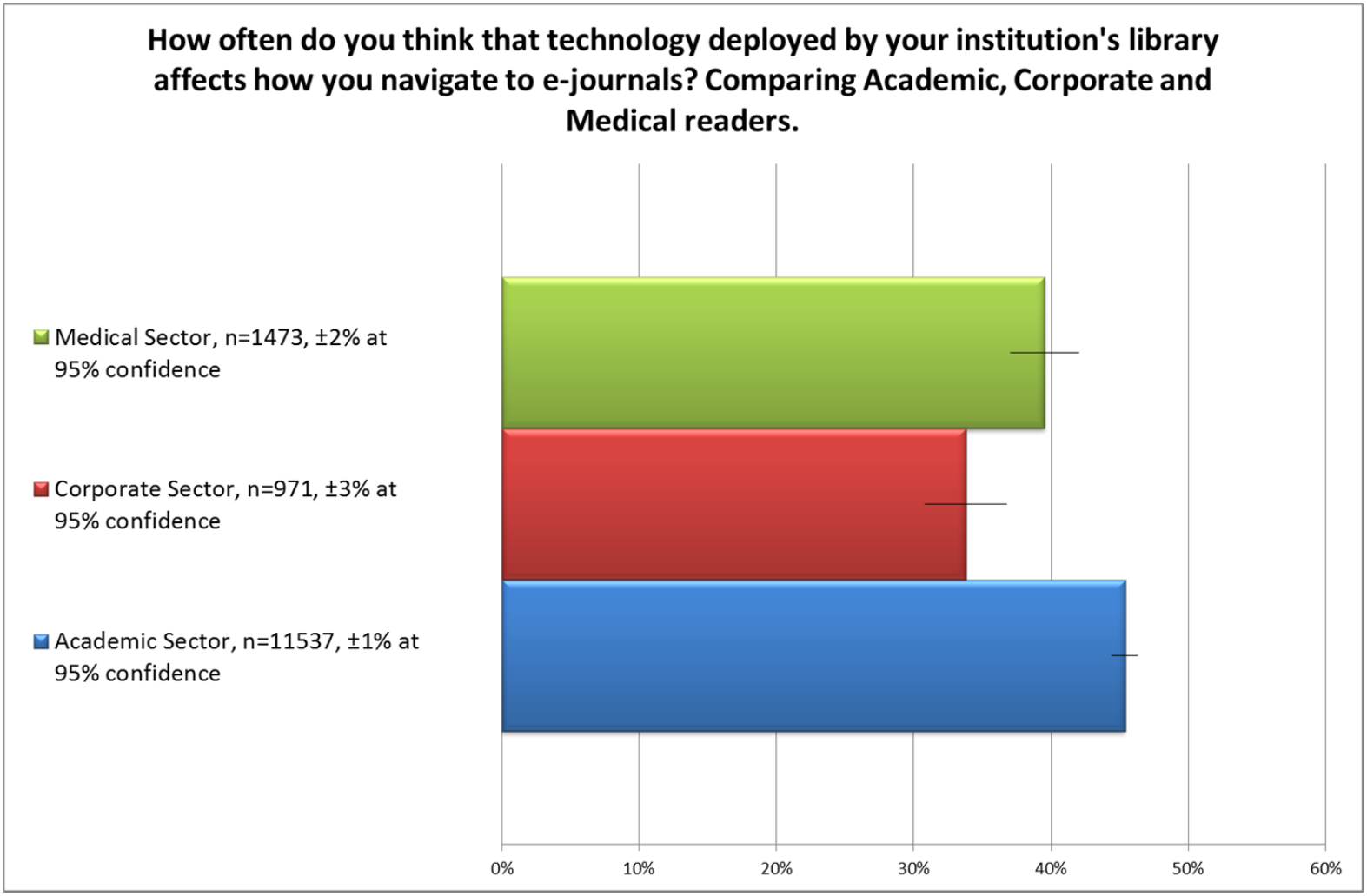


*Figure 55*

This plot shows the sum of those who said library technology affected navigation more than 50% of the time in each category. The academic sector has a significantly greater level of awareness/visibility of library technology than the medical and corporate sectors. This may be that library technology is more visible in the academic sector or that patrons receive more training on library tools and resources, or perhaps that investment in library technology is just much higher in this sector.

 

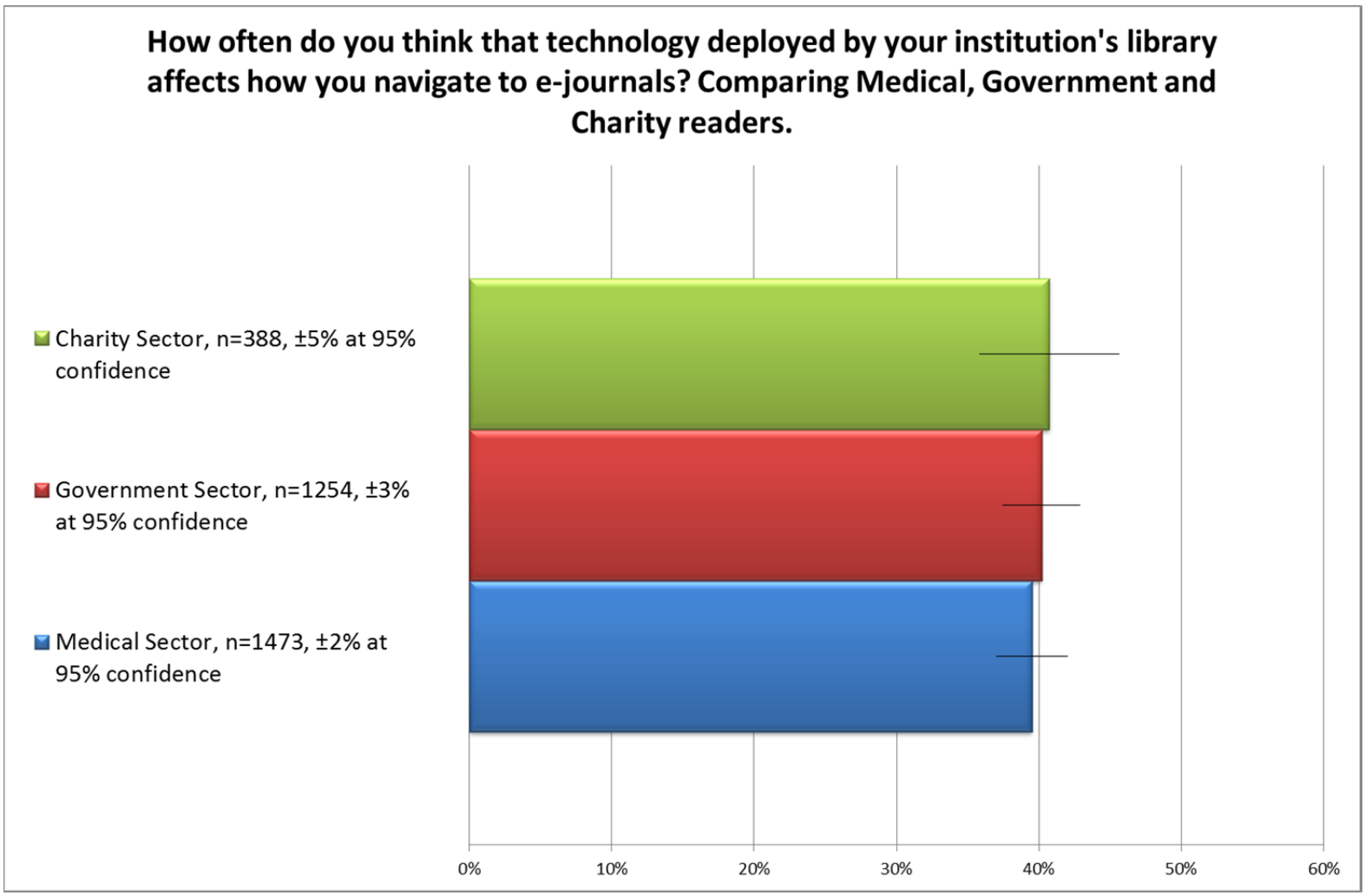


*Figure 56*

The results for government and charity sectors are essentially the same as the medical sector, but the sample size for the charity sector is relatively low which makes the error bar fairly large. There is very little difference in these sectors, it may be they behave in a very similar way or take up is comparable across sectors.

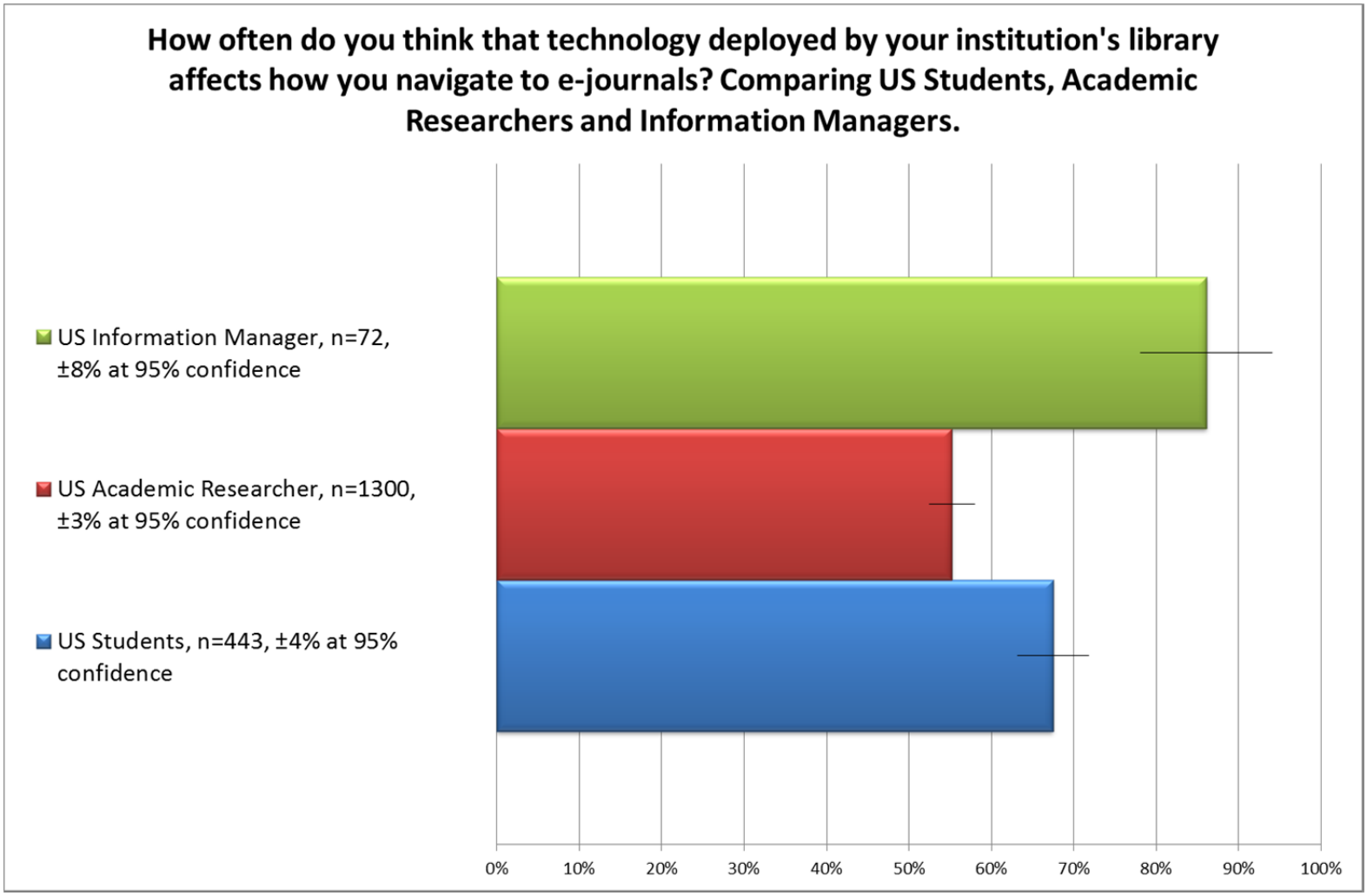


*Figure 57*

Not surprisingly, US Information Managers are highly aware of the effect of library technology, and US students are more aware than the researchers, which might be related to the amount of training new students have on information literacy and tools in US universities. Library technology is more generally recognised by academic researchers and students in the US than in the overall result for the academic sector shown in Figure 55. This again may be related to the awareness-raising and training that libraries in this region deploy.

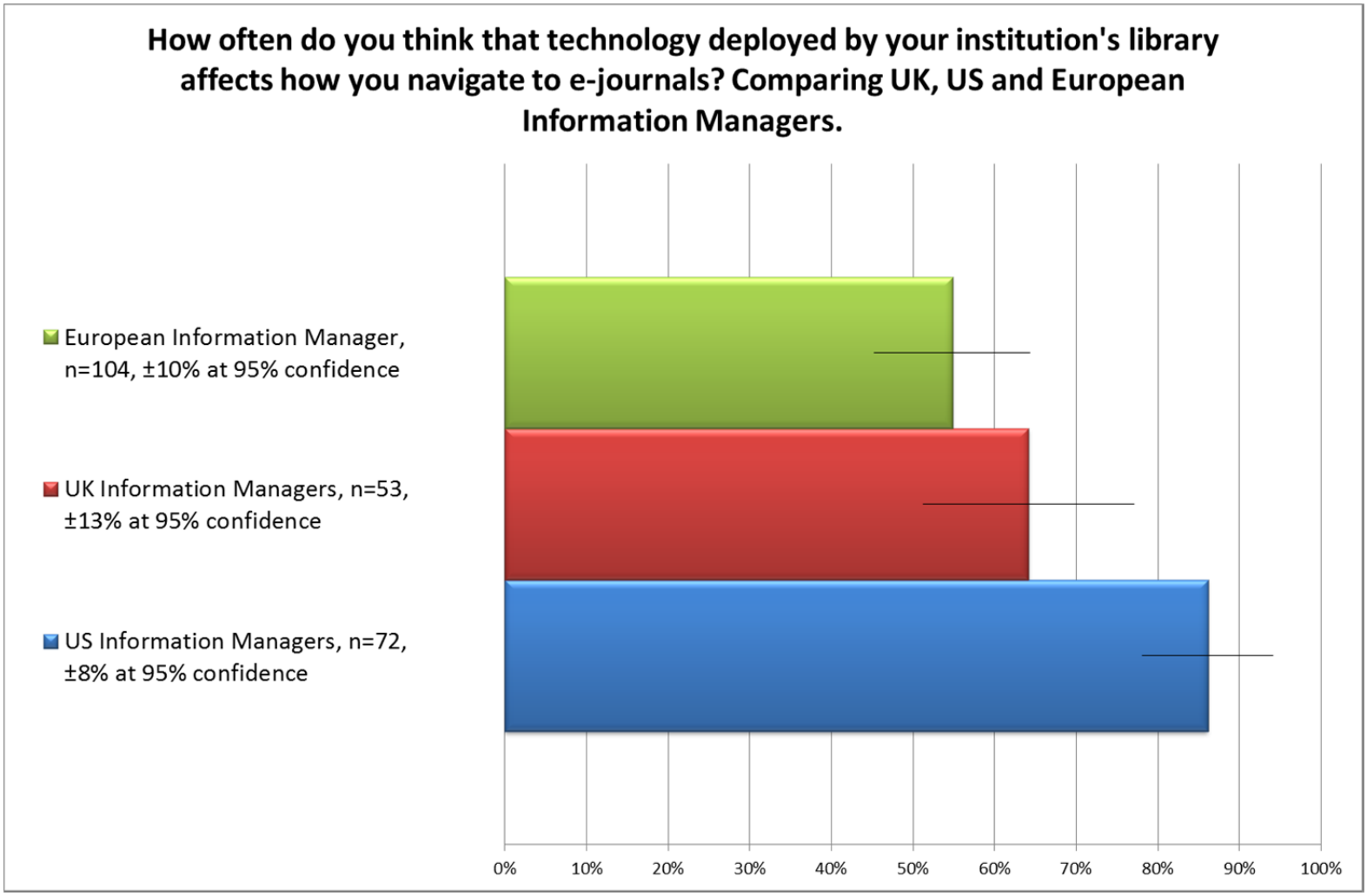


*Figure 58*

By comparing awareness for information managers, one assumes this will be a relatively good measure of technology deployment and effectiveness, since information managers should be aware of library technology if it is present. We see a higher proportion of library technology deployment in the US than in UK/Europe. Note that the figures for Europe will include as a subset all of the information managers from the UK, so in practice the figures for Europe minus the UK will be somewhat lower than the 55% figure indicated. However, the error bars on these measurements are such that the difference between the UK and Europe could only be considered as indicative.

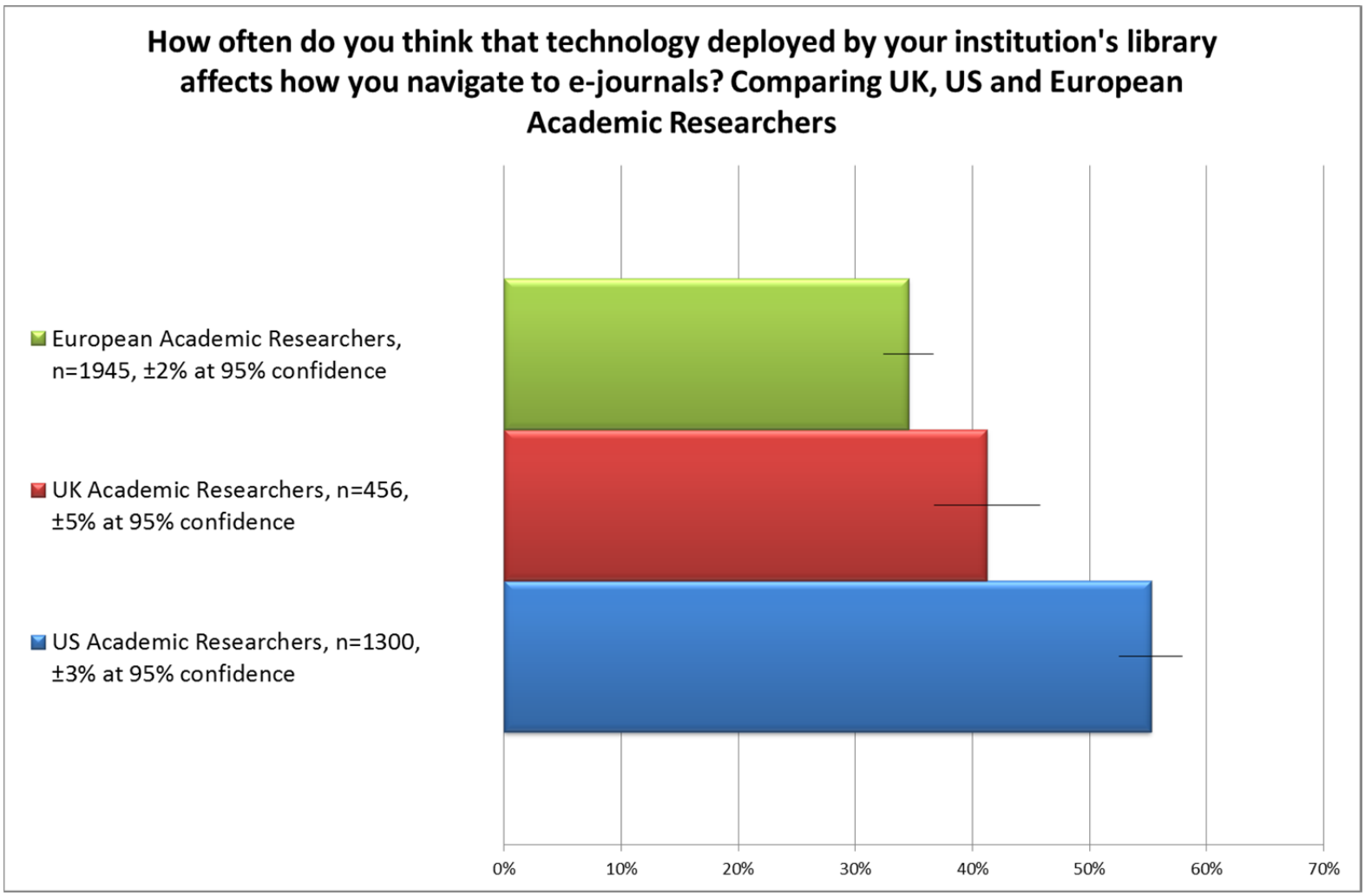


*Figure 59*

The results for academic researchers mirror those of the information managers which appear to provide further evidence that library technology is more widely deployed and recognised in the US than in the UK and Europe. With a much larger sample of data for researchers than information managers, the results take on greater significance.

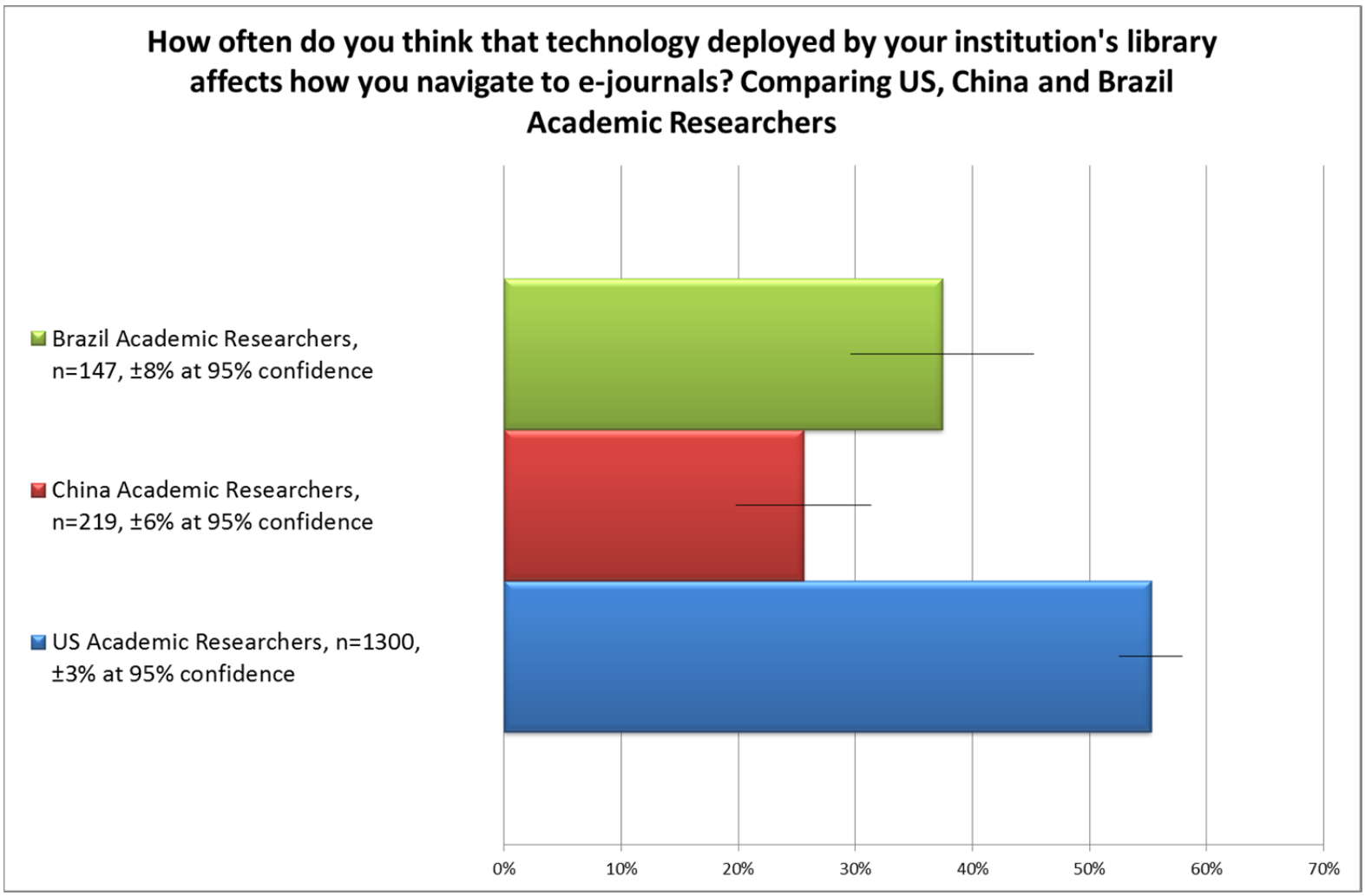


*Figure 60*

As an indicative result only, Brazil may be making more use of library technology than China, but both are certainly making less use than the US.

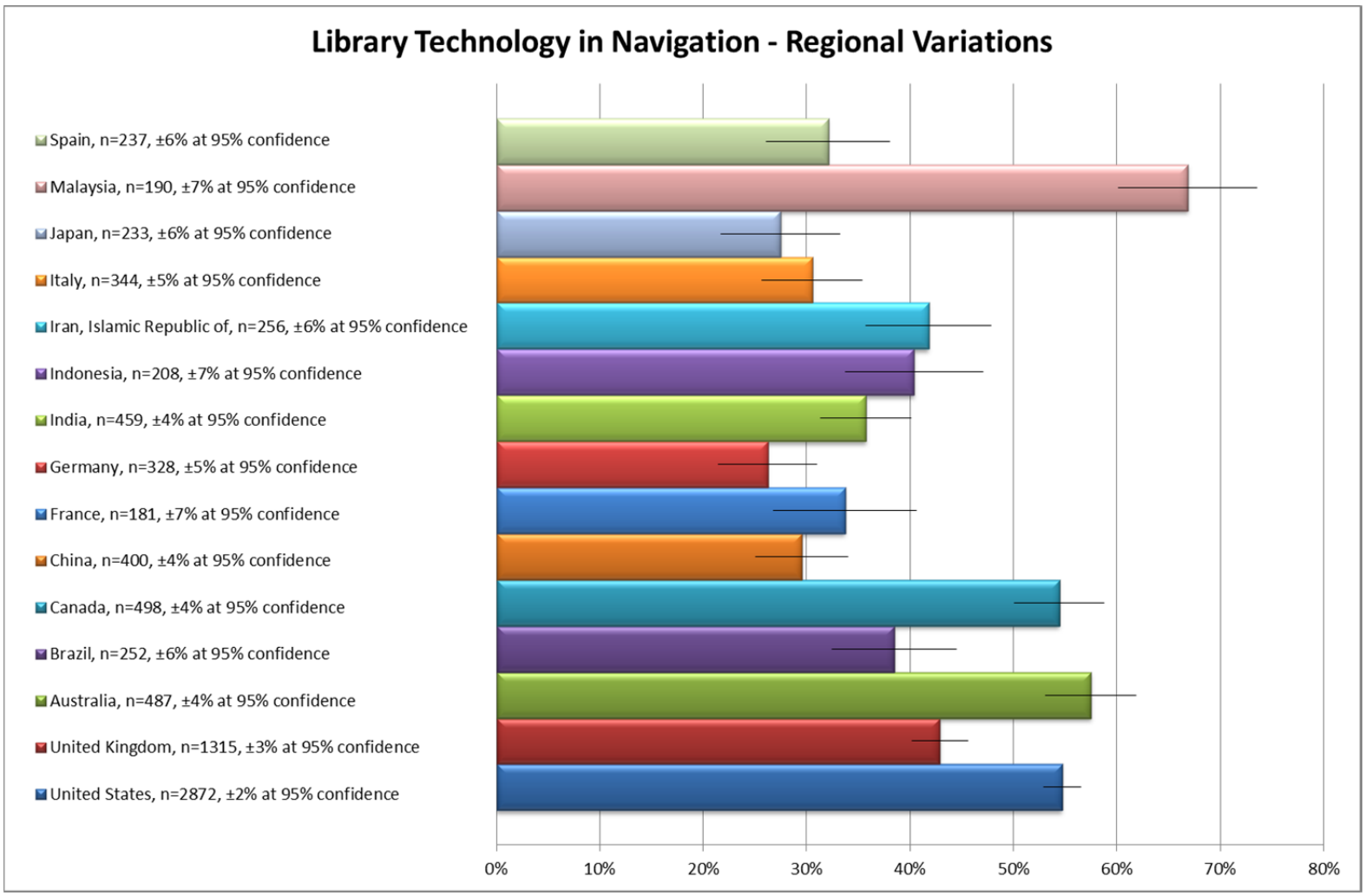


***Figure 61***

In this plot we show the results for the 15 countries providing the highest aggregate response to the survey. Readers in Malaysia are highly aware of library technology, much more so than any other country, with the possible exception of Australia. Awareness in Canada, US and Australia is more on a par. There is an indicative result that awareness is lowest in Germany, Japan and China which either indicates that take up in these regions is low or it is so unobtrusive, readers are not aware of how the library affects discovery. Perhaps somewhat surprisingly, awareness in Iran is relatively high which supports the view that the Middle East is becoming an important market for library technology.

# SEARCH ENGINE PREFERENCE

The survey asked the question:

**"If you use search engines to find journal articles, how often do you use each of the following?"**

Respondents were asked to state how often they used Google, Google Scholar, Microsoft Academic Search, Yahoo, Bing, Scirus, Baidu, or "Other" resource. For each one they could choose "**All the time, Most of the time, Some of the time, Very occasionally, Never"** and these were given a relative score of 6,4,2,1,0 respectively, as in other calculations. The maximum score, therefore, is 6.

## REGIONAL COMPARISONS

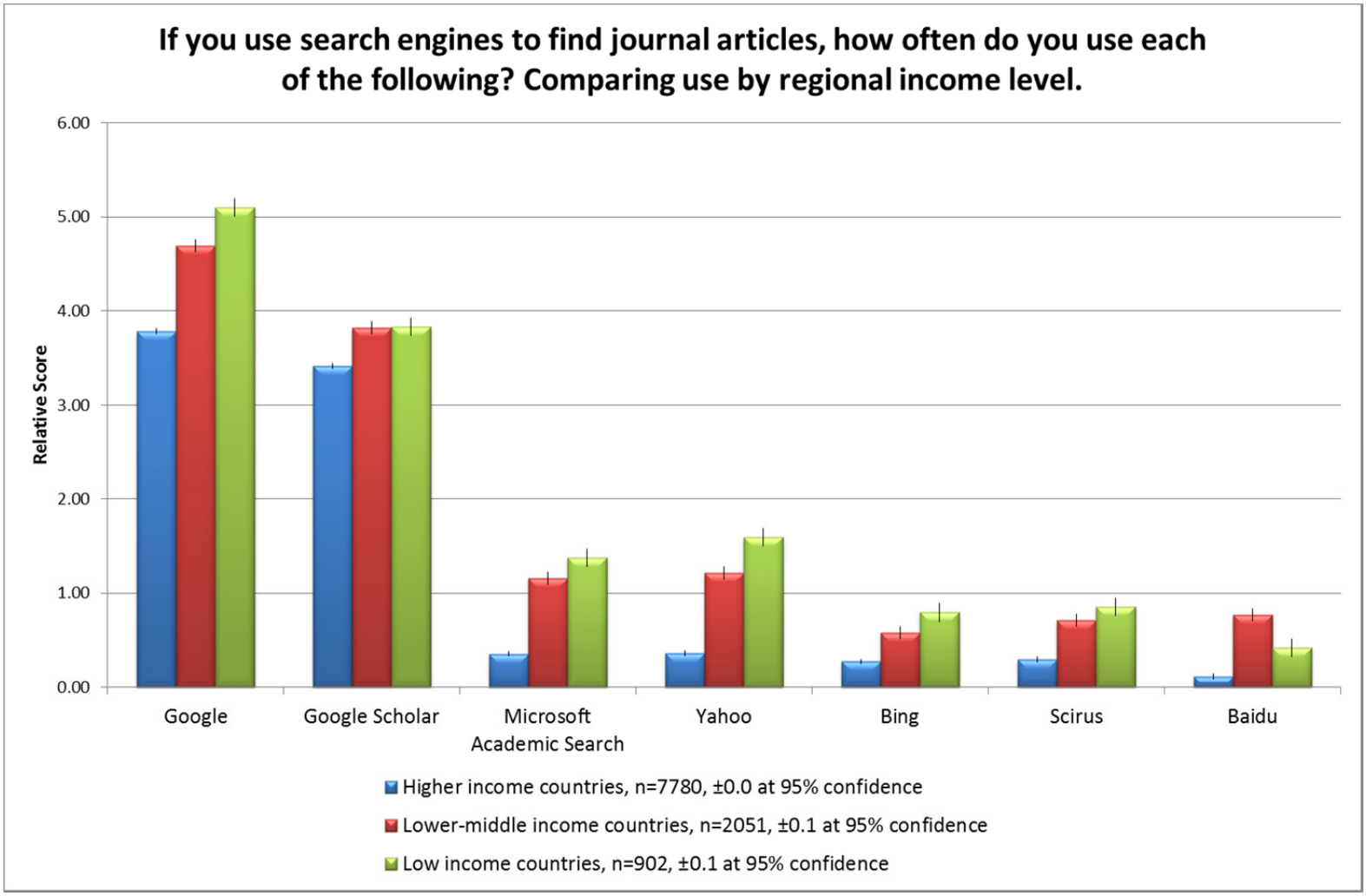


*Figure 62*

All the search engines are ranked more highly in poorer regions, presumably due to the absence of paid-for discovery tools. There is little difference in

the user of all but Google and Google Scholar in higher income countries. Higher income countries use Google slightly more than Google Scholar, compared to respondents in the poorer countries who use Google much more.

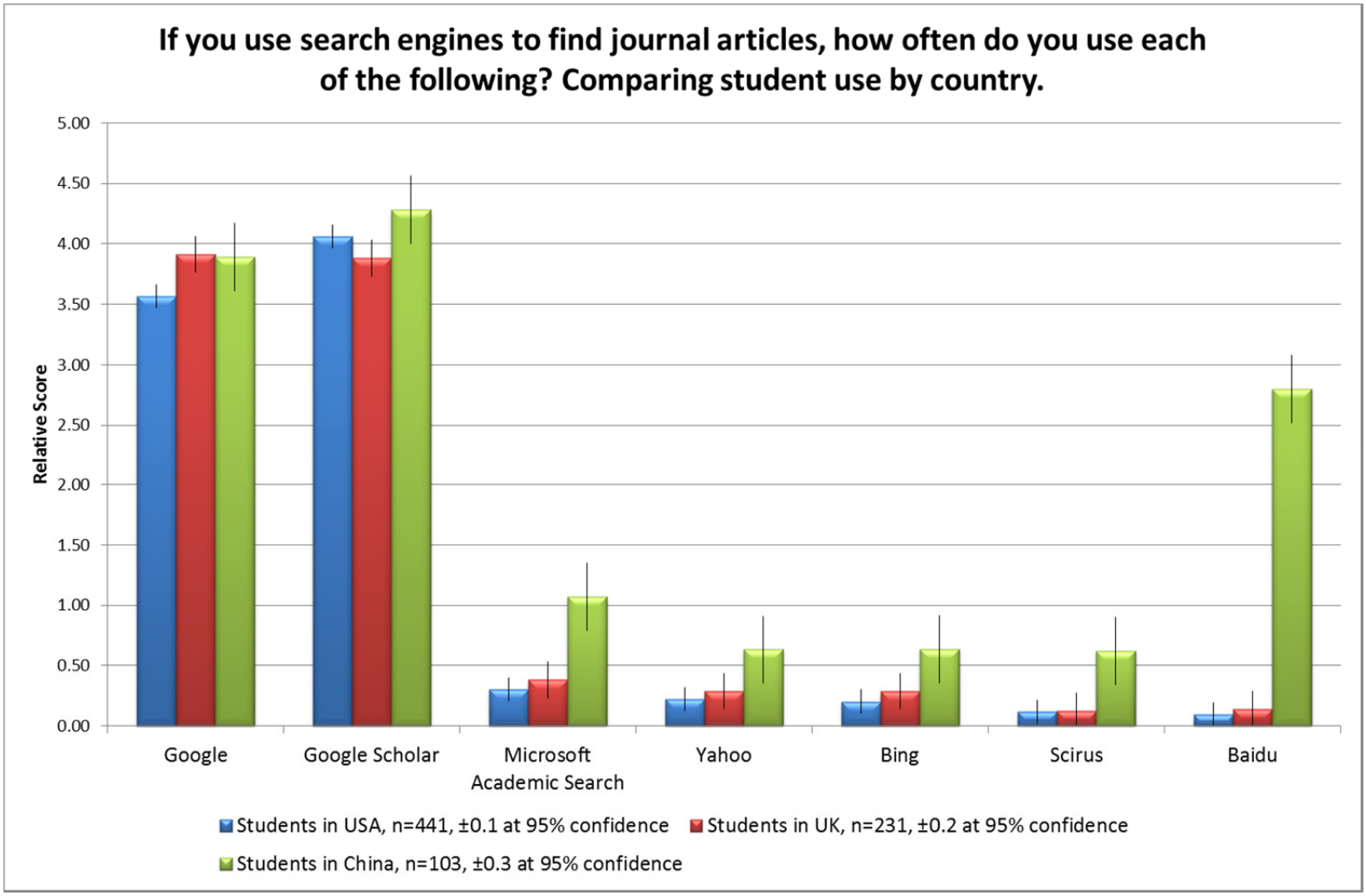


***Figure 63***

Students in China naturally make more use of Baidu than in other countries, but nevertheless it does not appear to exceed Google or Google Scholar. This result is perhaps surprising given the many anecdotal reports that indicate the difficulty of accessing Google in China. Students in the UK use Google and Google Scholar to the same extent and students in the US use Google slightly less.

 

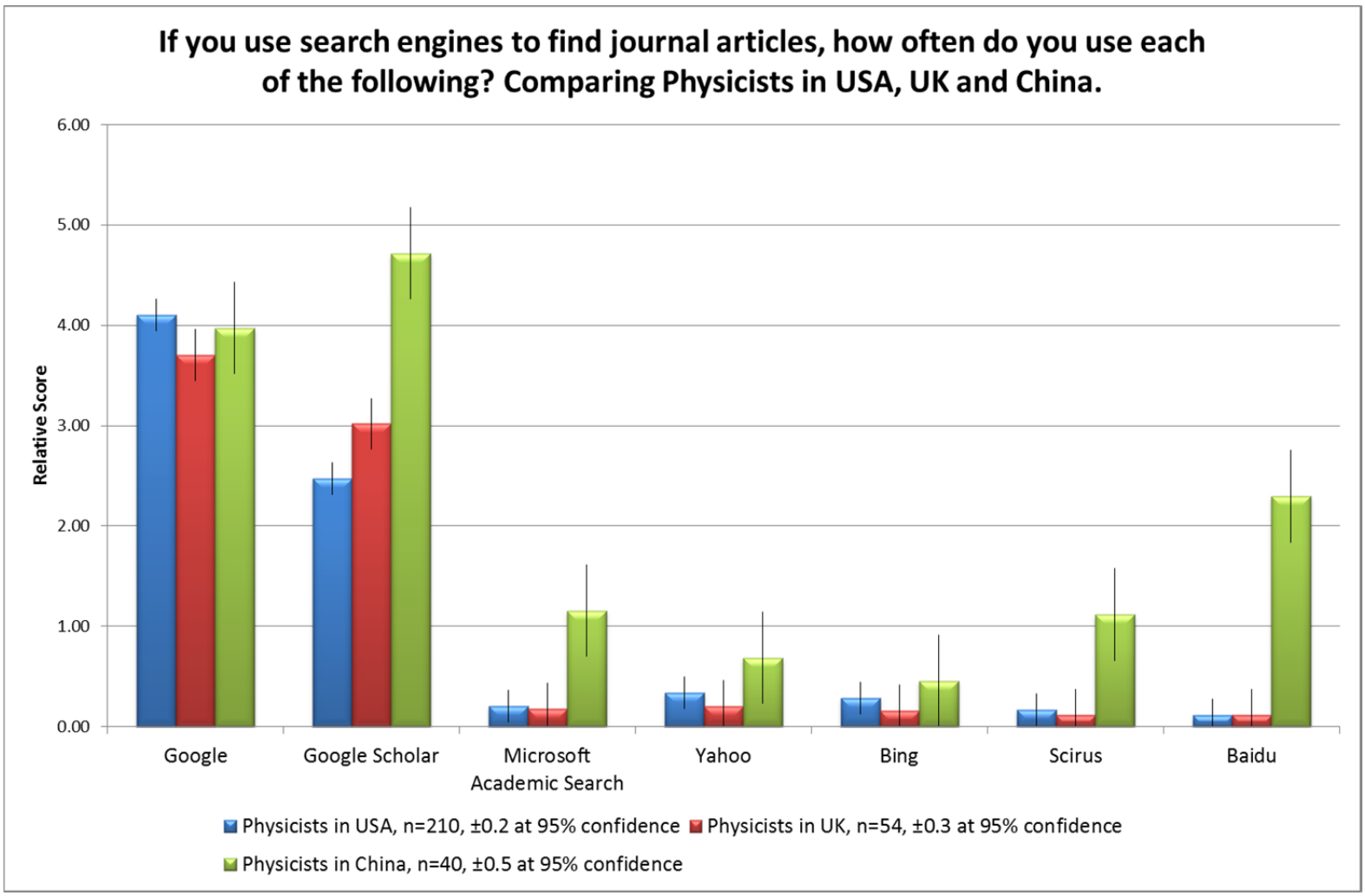


***Figure 64***

Physicists in China make considerably more use of Google Scholar than those in the UK and US and possibly use it more than Google. UK and US Physicists show a preference for Google over Google Scholar. Physicists in China appear to make more use of all the search engines available to them than their UK and US counterparts.

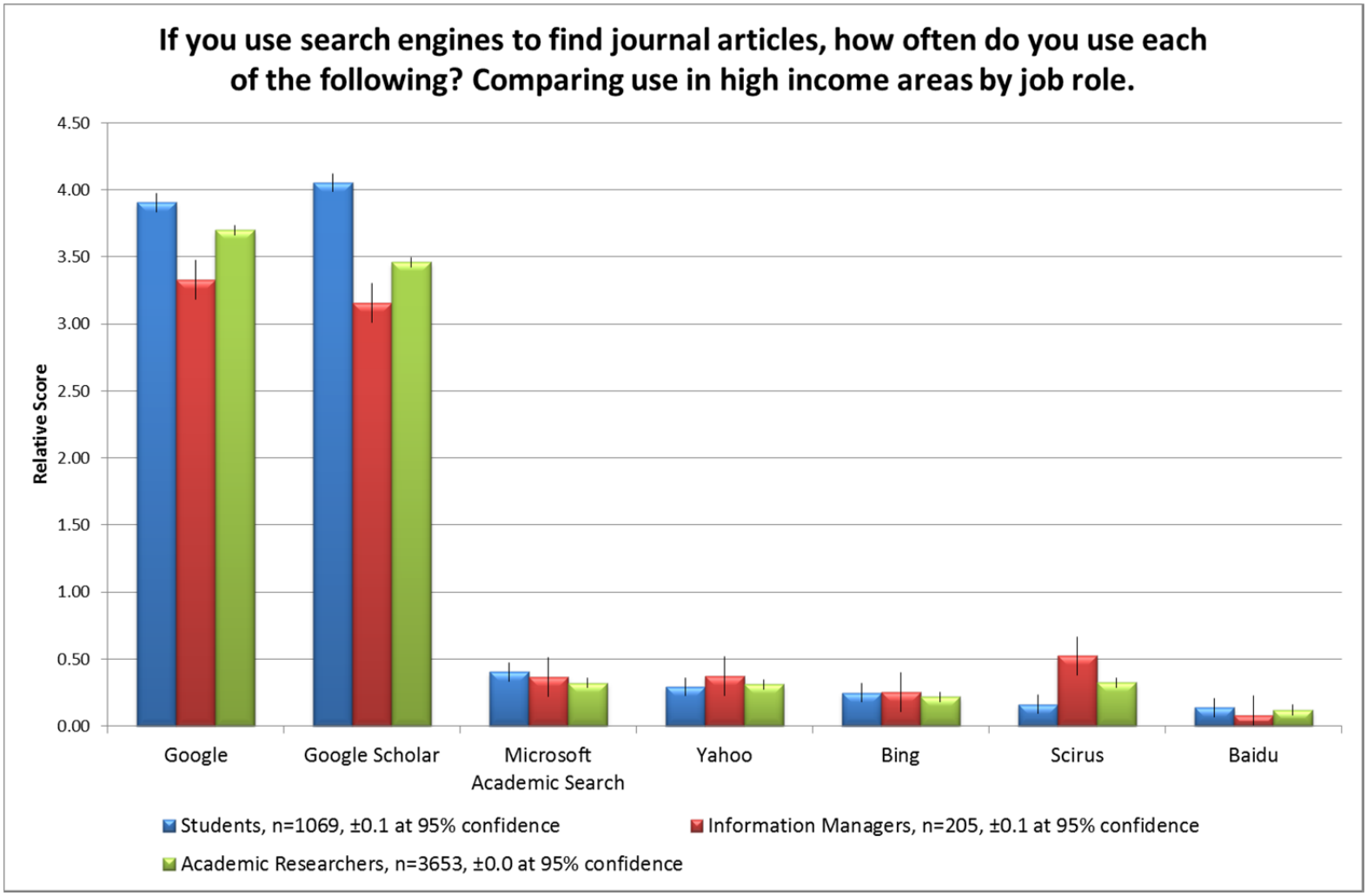


*Figure 65*

Information managers use Google search engines less than students and researchers. Presumably this is due to their use of more specialist tools. Of note perhaps, is that Information Managers make marginally more use of Scirus than students and researchers. Students use Google Scholar slightly more than Google, and perhaps surprisingly academic researchers use Google more than Google Scholar - maybe because they are higher users of A&I databases and will use search engines for a more general search, negating some of the need for Google Scholar.

 

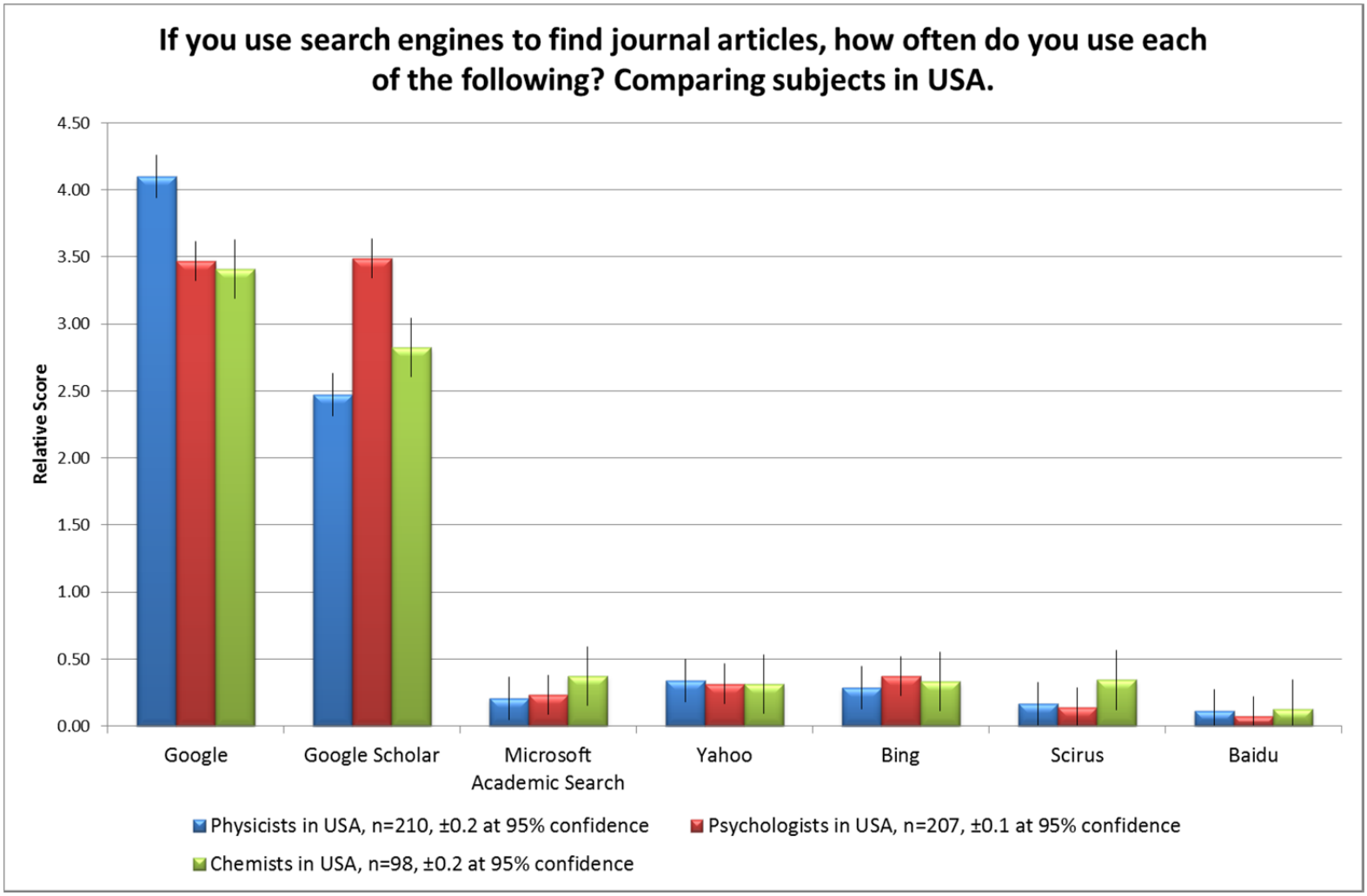


*Figure 66*

Physicists and Chemists in USA make considerably less use of Google Scholar than Psychologists. Physicists in the USA use Google more than Google Scholar and more than those in other subject areas.

 

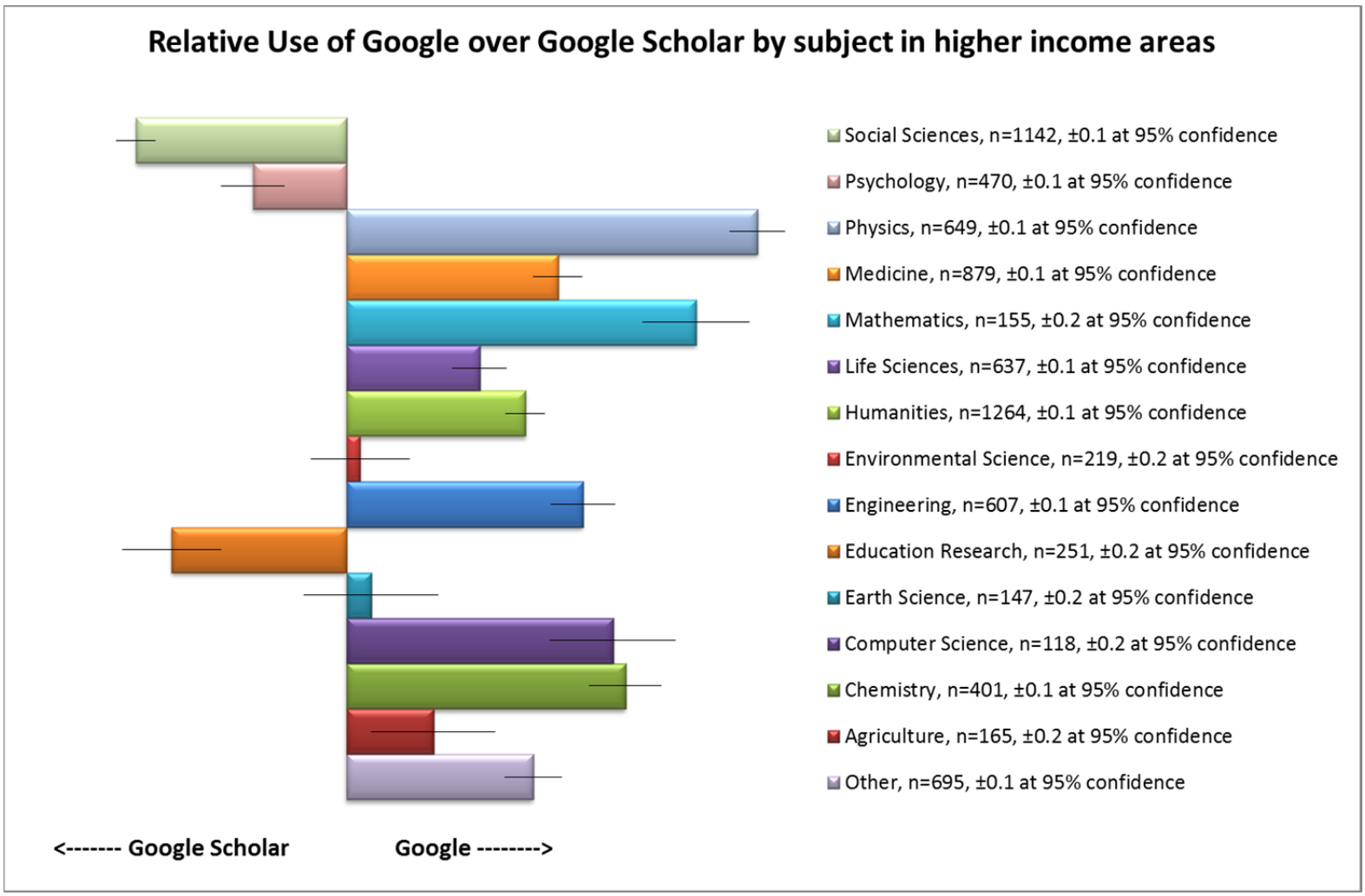


*Figure 67*

Comparing the behaviour by subject within higher incomes areas, we see that a number of subject areas purport to using Google Scholar more than they do Google, when using a search engine. The physical sciences rely more on Google than Google Scholar, Physicists especially so. Education Research and Social Science make more use of Google Scholar, whilst use in Environmental Science and Computer Science are on a par with each other.

## COMPARISONS BY SECTOR

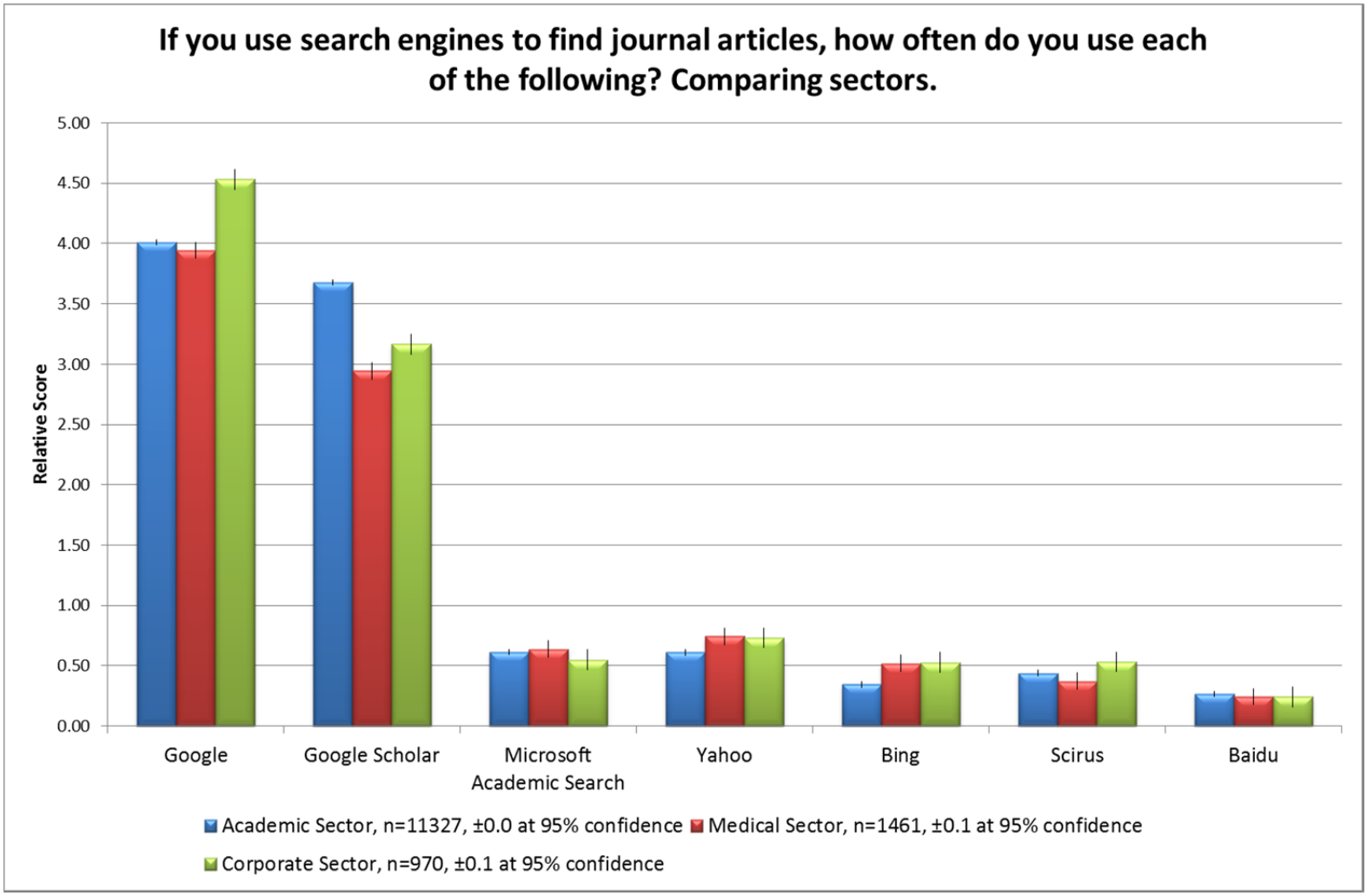


***Figure 68***

The Corporate sector shows a higher use of Google than the Medical and Academic sectors. The academics make up for the shortfall by use of Google Scholar, whereas those in the Medical arena most likely to use other specialist search, namely PubMed.

## COMMENTS

There is possibly some confusion in a minority of respondents' minds about what a "search engine" actually is, because in the comments field many respondents listed academic databases and other discovery resources.

Around 300 people commented in the "other" field they used PubMed or Medline and about another 200 said they used Web of Science/Web of Knowledge/ISI. Although not reproduced here, the results for Charity and Government sectors were very similar to the Corporate Sector. Around 160 respondents listed their library or university as an "other search engine", a

further 100 listed Scopus, 60 JSTOR and around 50 SciFinder. The only other general search engine listed was Yandex, the Russian search engine – 40 respondents listed it in the comments field.

 

# DEVICE PREFERENCE

The survey asked the question:

"**How often do you use each of the following device types to access online articles?"**

Respondents were asked to state how often they used Desktop Computer, Laptop Computer, Tablet Computer, and Phone. For each one they could choose "**All the time, Most of the time, Some of the time, Very occasionally, Never"** and these were given a relative score of 6,4,2,1,0 respectively, as in other calculations. The maximum score, therefore, is 6.

There is no comparative data for 2008 and 2005.

## COMPARISONS BY REGION

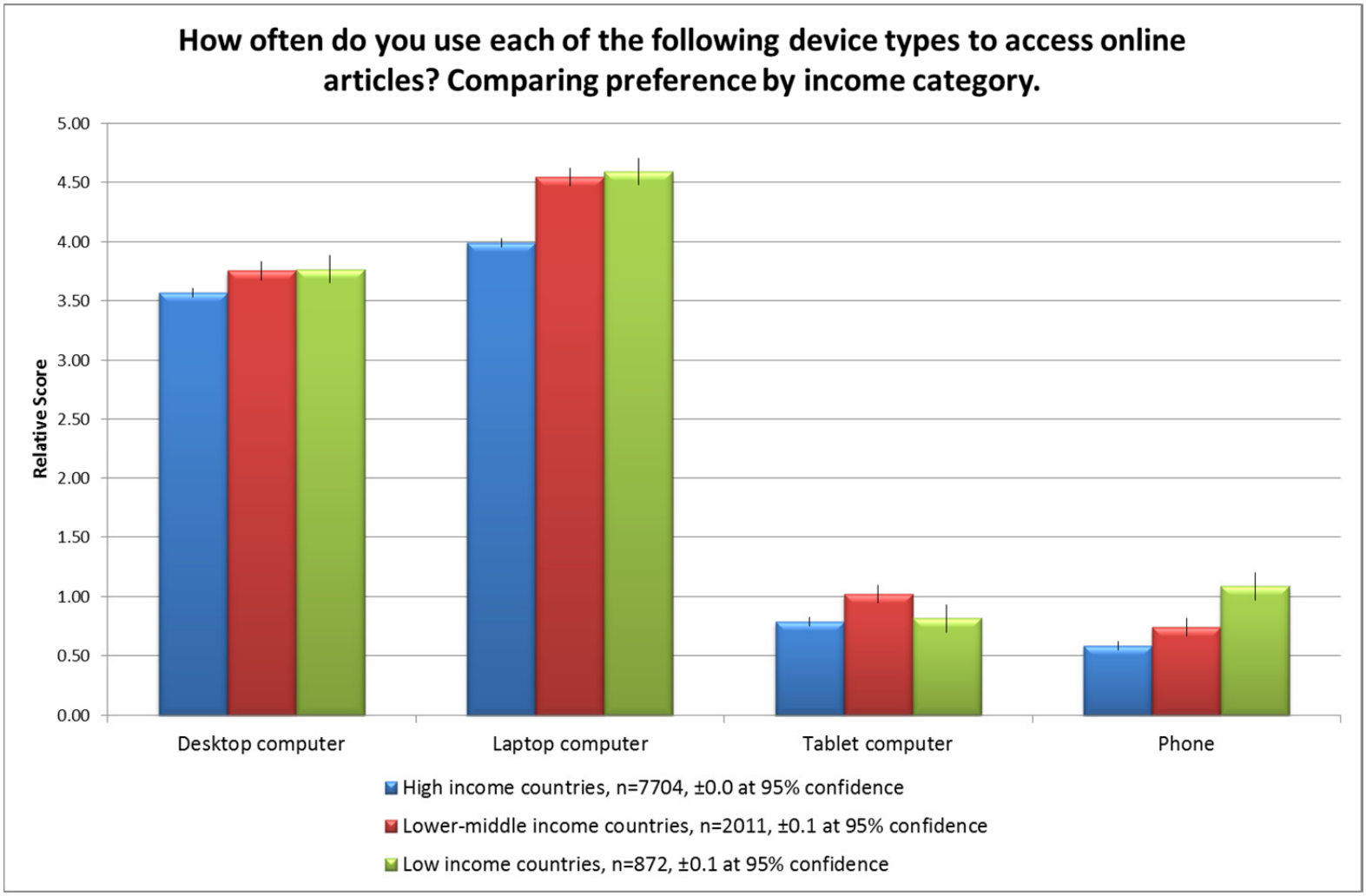


*Figure 69*

Our first breakdown is by World Bank regional income categories.

Overall, the majority of access to online articles appears to be from mobile devices, i.e. laptop, tablets and phones with laptops being the dominant device in this group.

Phone use for access is greatest in the lower-income countries, which is consistent with other studies that show that lower income countries have moved more quickly and in some cases directly to wireless technologies for internet access, bypassing somewhat the wired desktop environment.

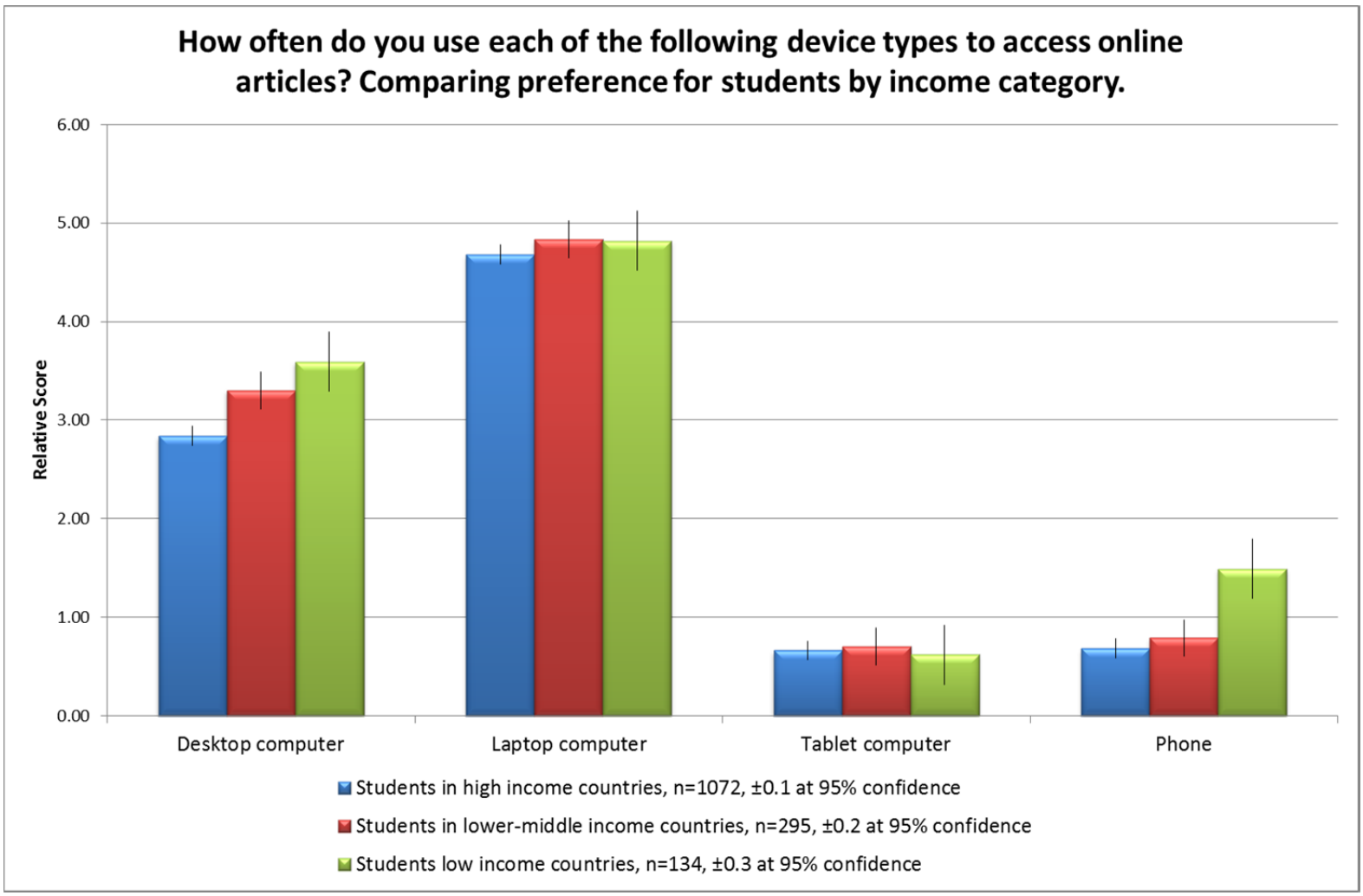


*Figure 70*

Students in higher income areas make considerably less use of desktop computers than other students but their use of laptops and tablets is on par with other income groups.

Students in the poorer countries make greater use of mobile phones in journal access.

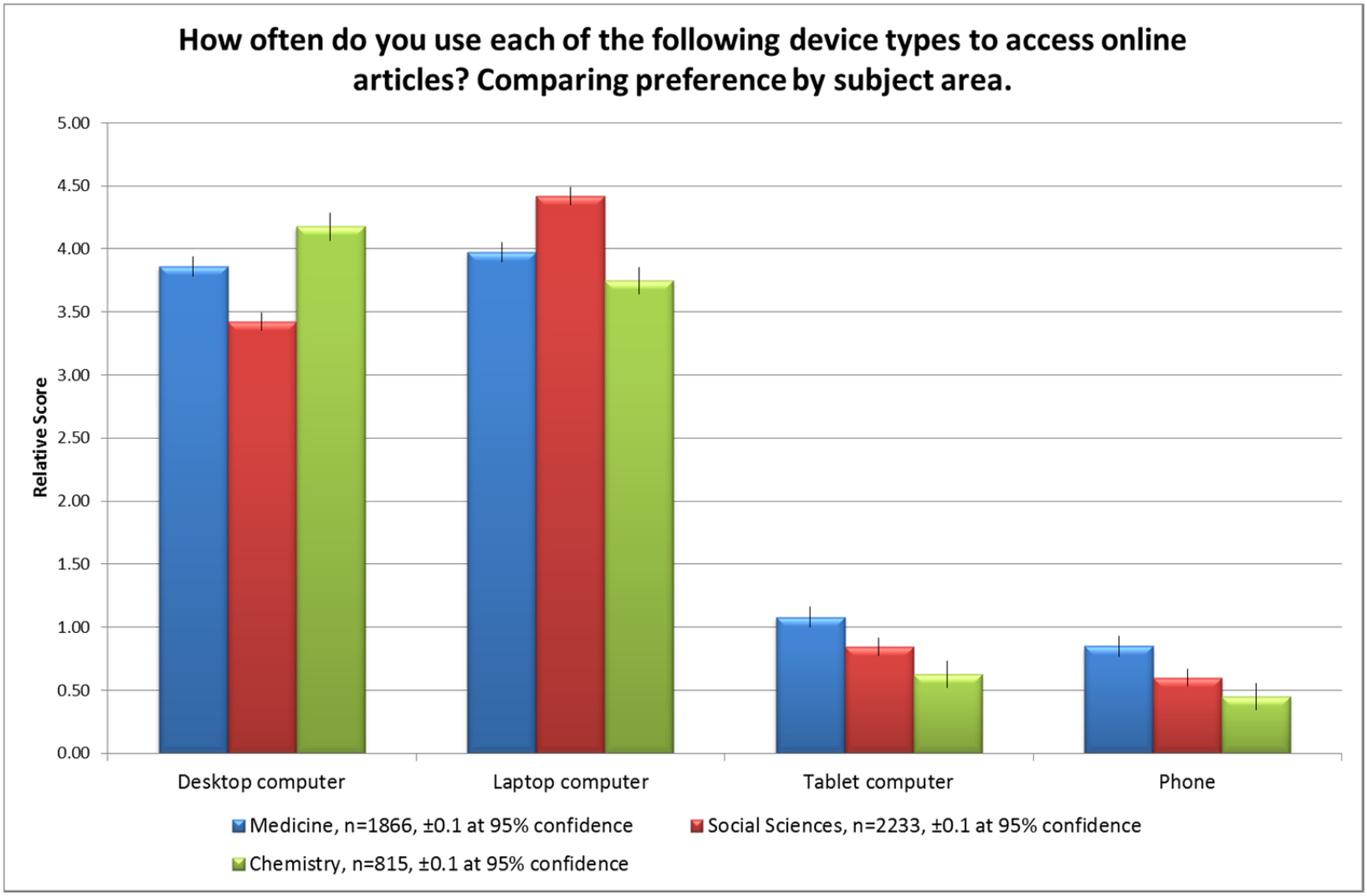


*Figure 71*

Social scientists make less use of desktops and more use of laptops than those in Medicine or Chemistry

As perhaps expected, those in Medicine make greater use of tablet devices and phones to access journals, but it is still small in comparison to desktop and laptop use.

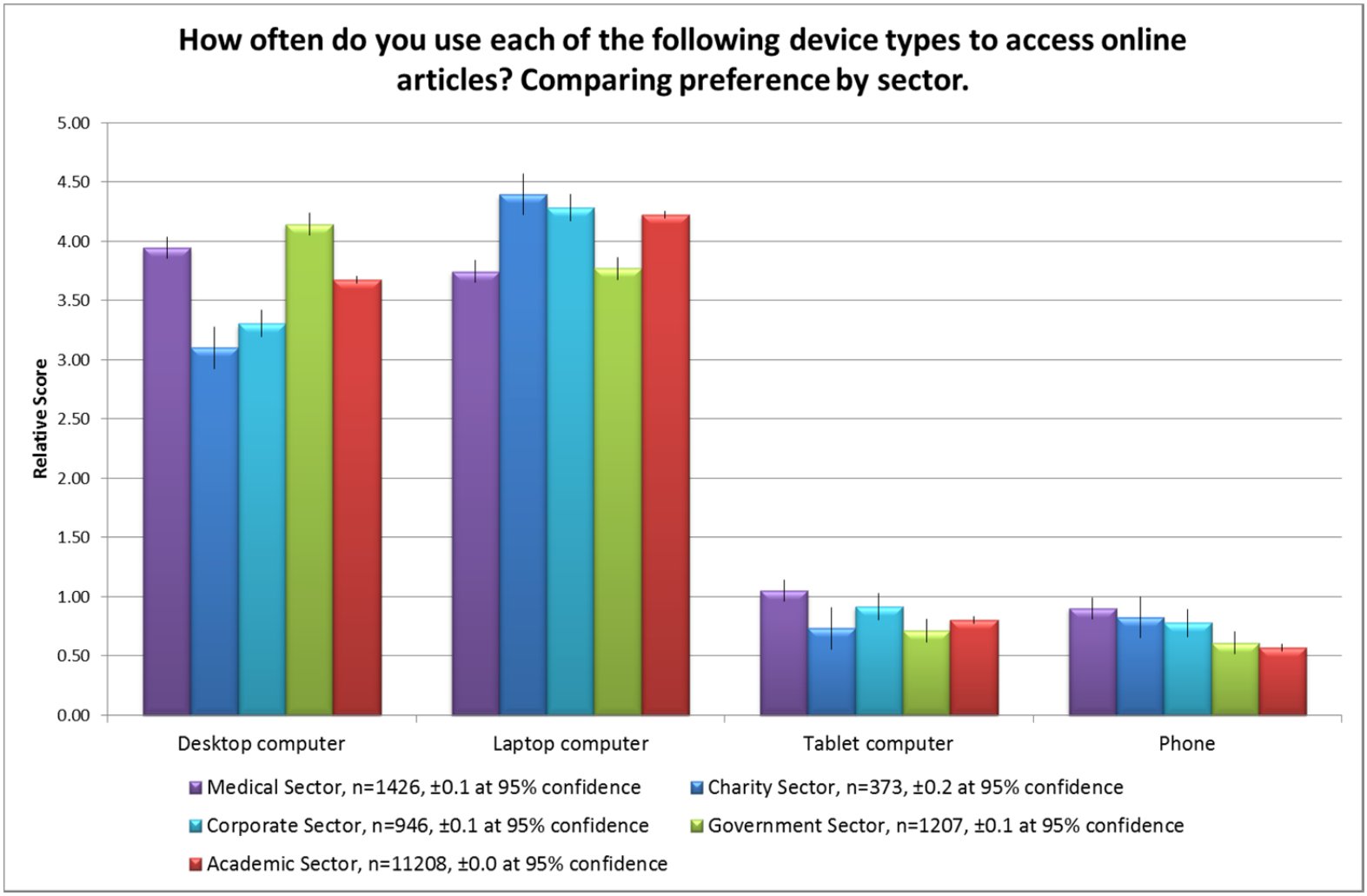


*Figure 72*

The Academic sector uses mobile phones for journal access less than the medical, charity and corporate sectors, and a similar amount to the government sector. There is an indicative result that the group using tablets and phones to access online journal articles is the medical sector.

The government sector makes the most use of static devices and their use of laptops is on a par with academics. Charity and Corporate sectors make the least use of desktops for this purpose.

 

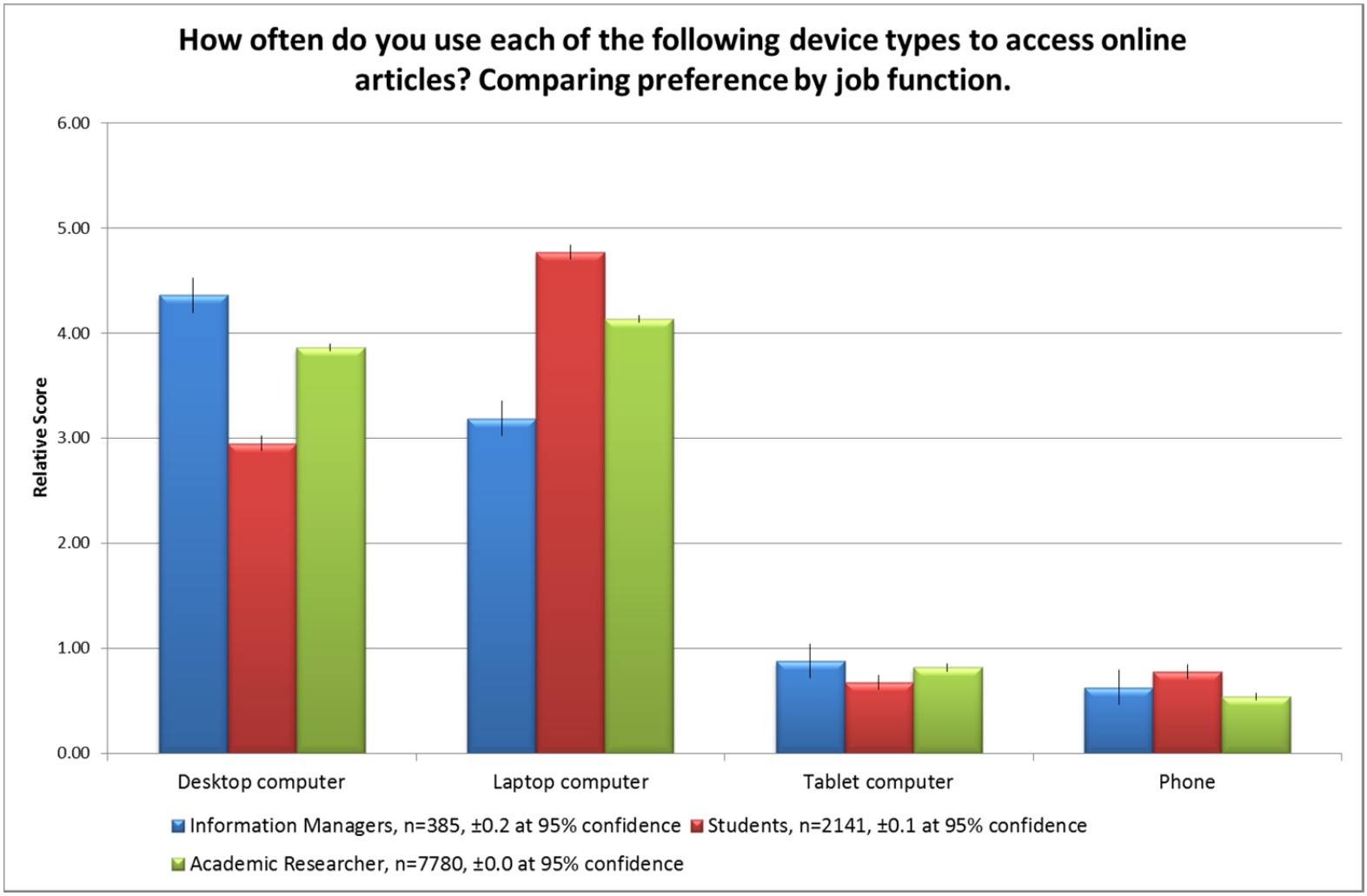


*Figure 73*

Information managers have a much greater reliance on desktop access than other forms, indicating that their roles are still very much desk based. Perhaps unsurprisingly students are much more laptop based. Academic researchers use laptops slightly more than desktops. Given the margin of error there is not much difference in use of tablets and phones for these groups, although you could say students use tablets slightly less than academic researchers and phones slightly more.

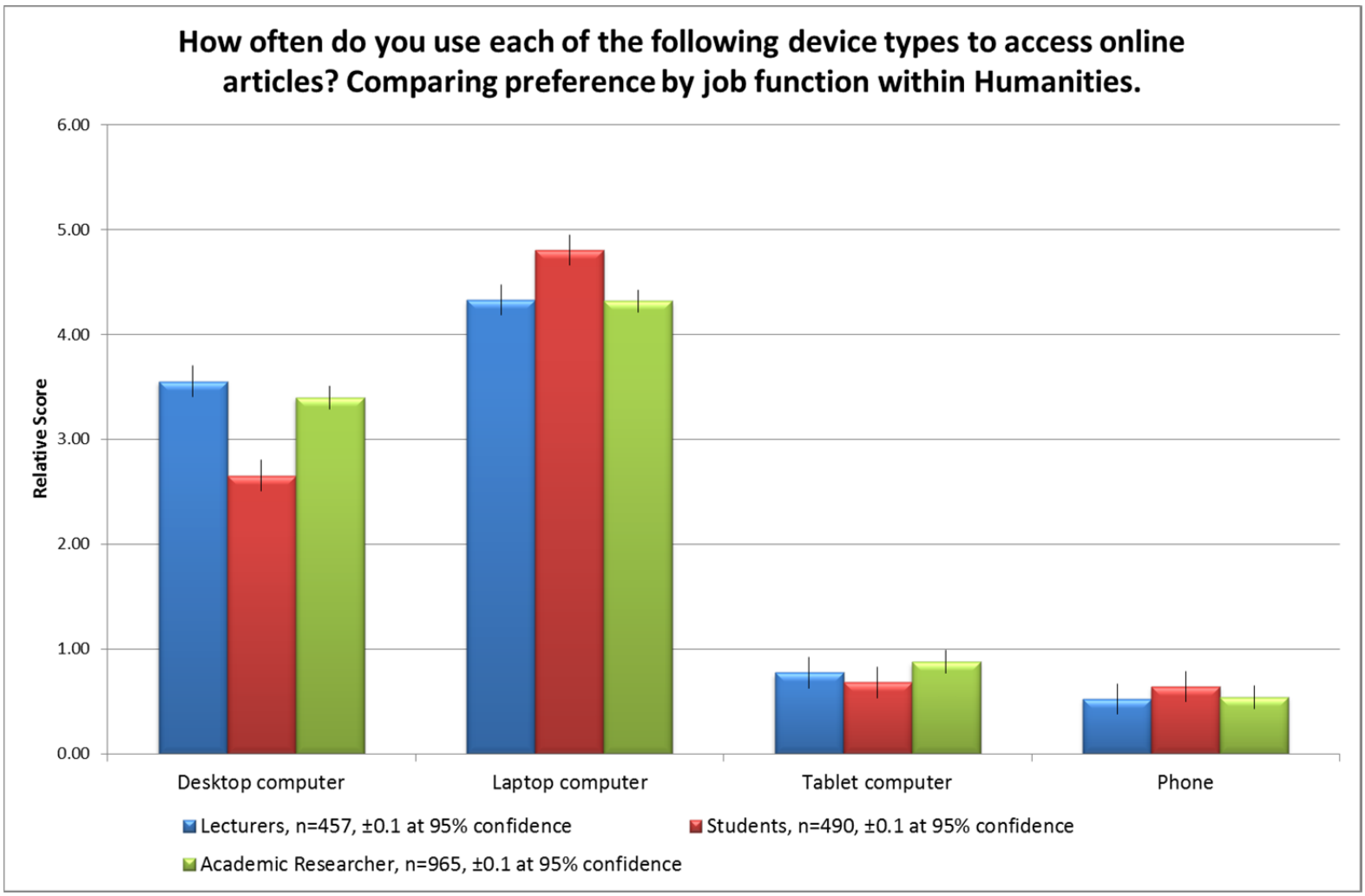


*Figure 74*

Within humanities, this pattern is repeated for students and academic researchers across the board and the level of use of the different device types is very similar to their counterparts in all subject areas. Lecturers show a preference for laptops over desktops.

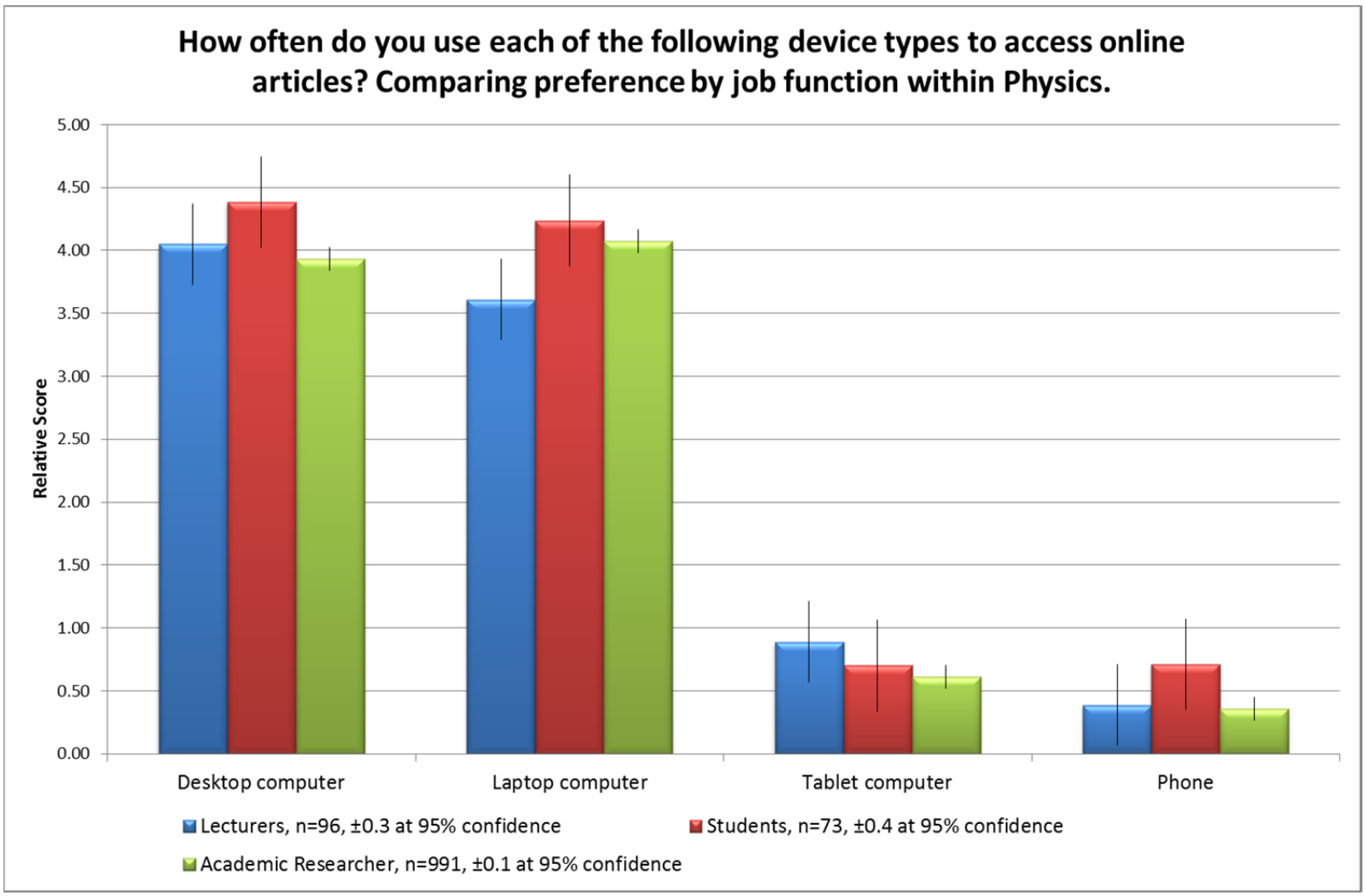


*Figure 75*

Within Physics, students make much greater use of Desktops than in Humanities (see Figure 74) and indeed students in all subject areas (see Figure 73). Lecturers in Physics also make more use of desktops when compared to lecturers in all subject areas.

# APP USE

The survey asked the question:

"**Do you use Apps on your phone to find and read e-journals? Tick all that apply.**"

Respondents were asked to indicate which of the following statements were true and the results are represented as percentages. The responses were not mutually exclusive, so percentages can add up to more than 100%.

- I don't have a phone that supports apps
- I don't use apps on my phone to find and read e-journals
- I use apps to view the latest issues of selected journals
- I use apps to search content in selected journals
- I use apps to read content when I'm offline
- I use apps to browse the articles of journals

There is no comparative data for 2008 and 2005.

The results show that, in absolute terms, App use is quite low.

 

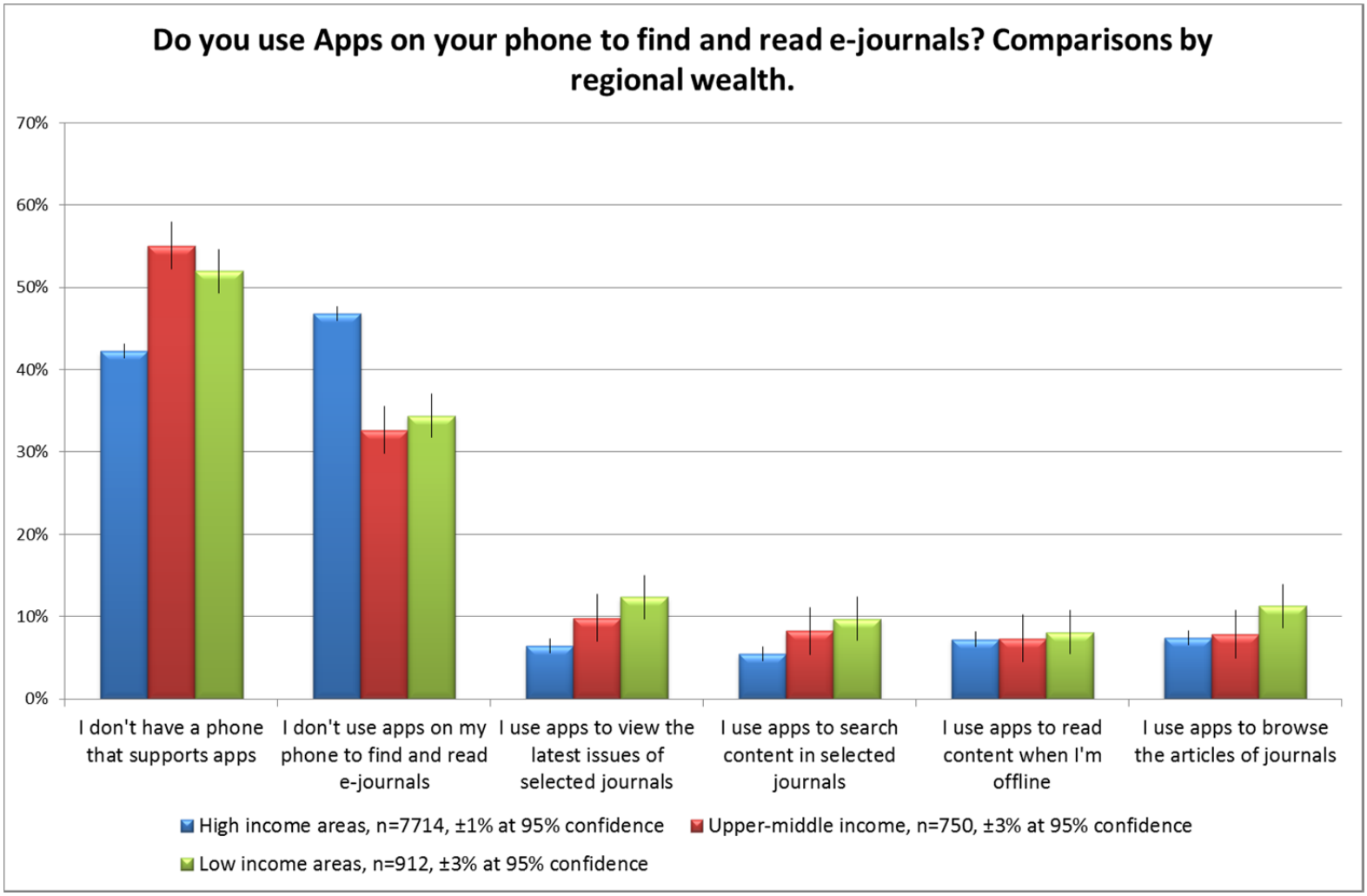


*Figure 76*

In these analyses, income areas use the World Bank classifications based on respondent's country classification.

While more people in lower income countries do not have a phone that supports apps, of those that do have such phones, there is an indicative result that a higher proportion of them use their phones to access journals.

Readers in lower income countries use apps to view, search and browse the latest articles of journals more than those in higher-income countries.

All regions use apps to read content when offline equally (or at least not significantly differently).

In absolute terms, the use of apps in reading online content is quite low – around 10% of all readers.

 

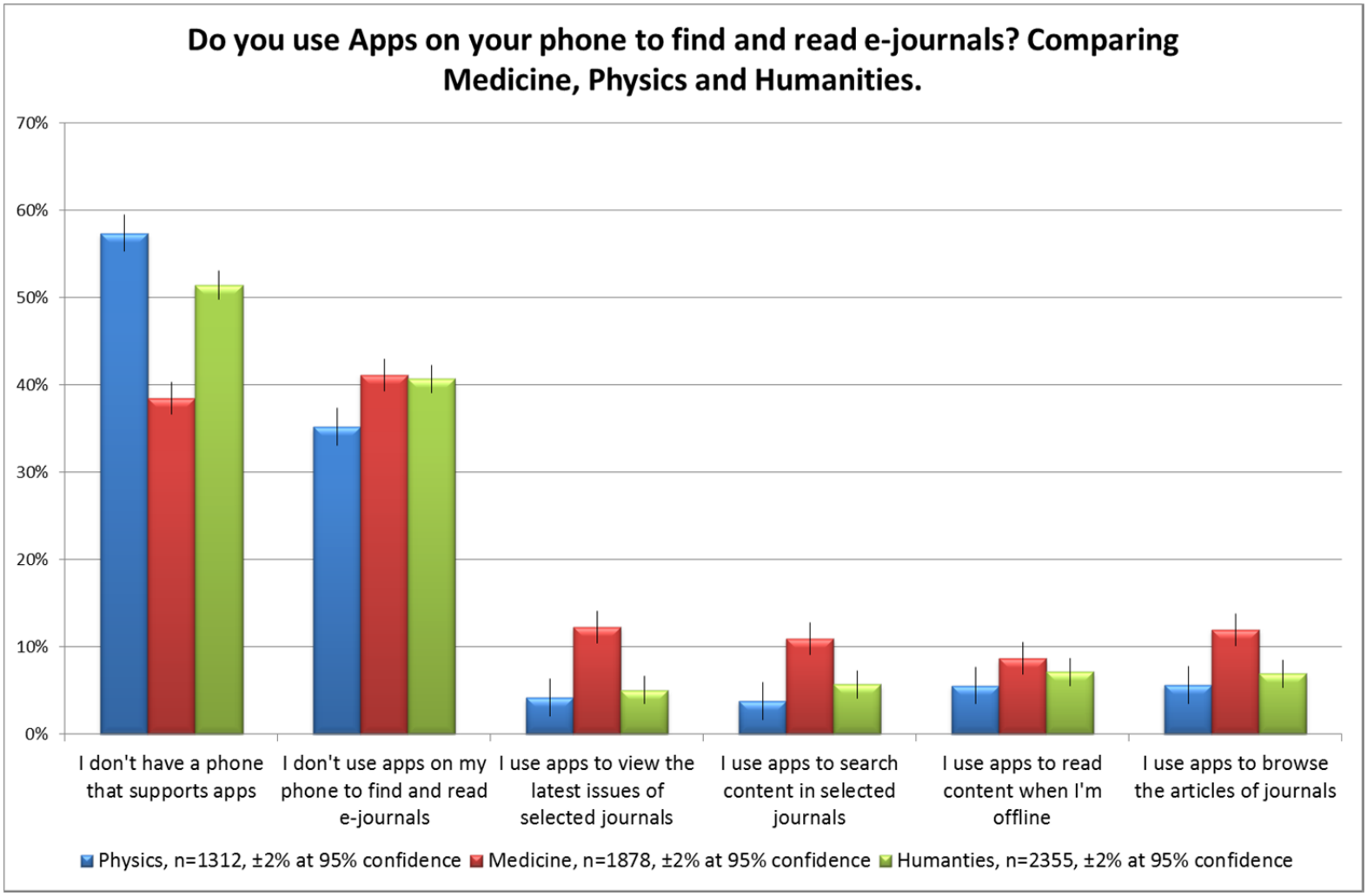


*Figure 77*

As perhaps expected, those in Medicine make significantly greater use of Apps on smartphones to access journal content, and are significantly better equipped with smartphones than others. It may be surprising to see that Physicists are the least well-equipped of these subject areas in terms of smartphones.

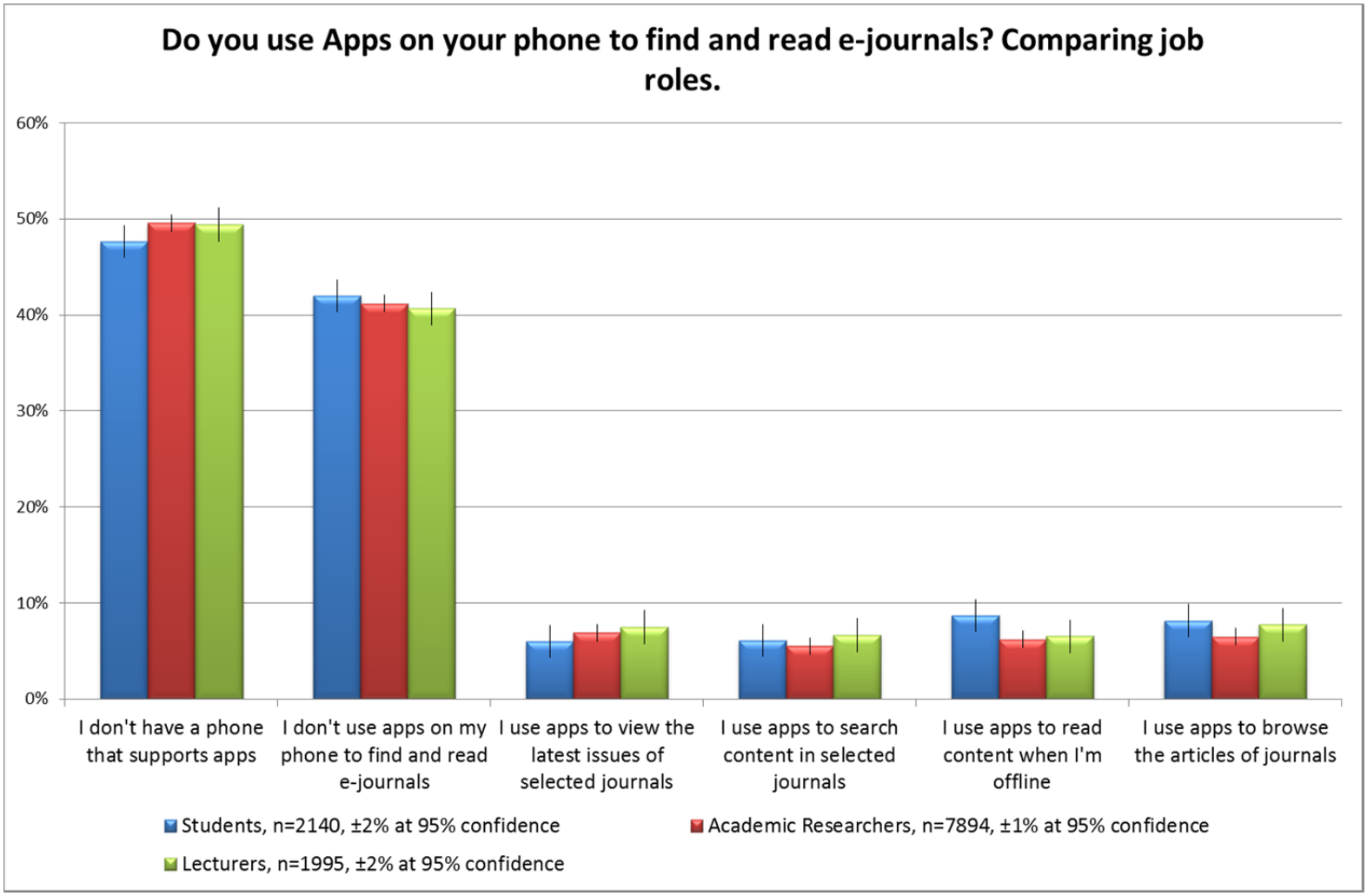


*Figure 78*

Given the margins of error, there is no observable difference in behaviour between students, lecturers and academic researchers in the use of apps.

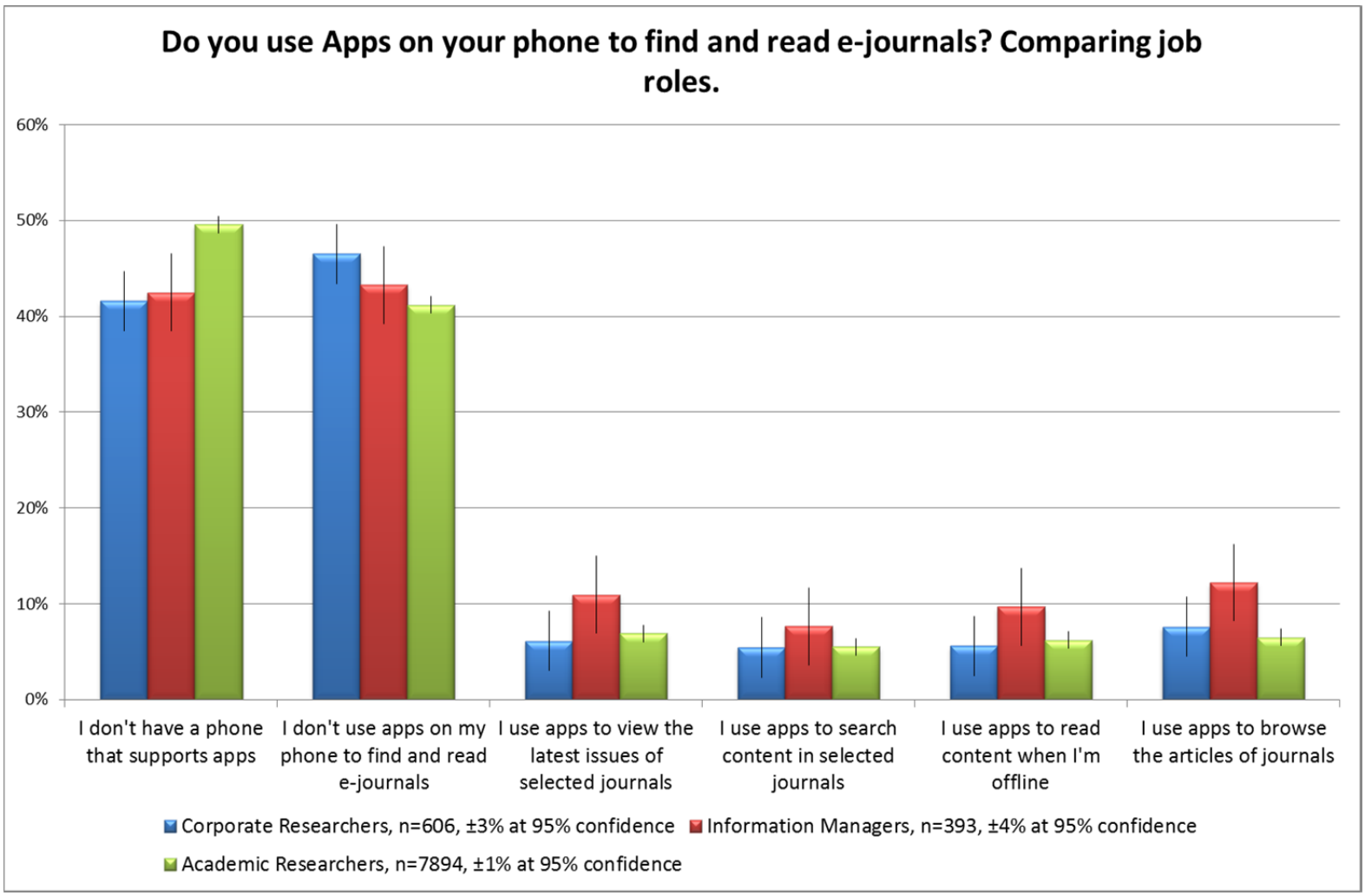


*Figure 79*

In comparing researchers in academic and corporate environments, we find that the corporate researchers are better equipped with smartphones than their academic counterparts, but apparently don't make any more use of them for accessing journals via apps.

As an indicative result, information managers may be making more use of apps in accessing journals, especially in browsing.

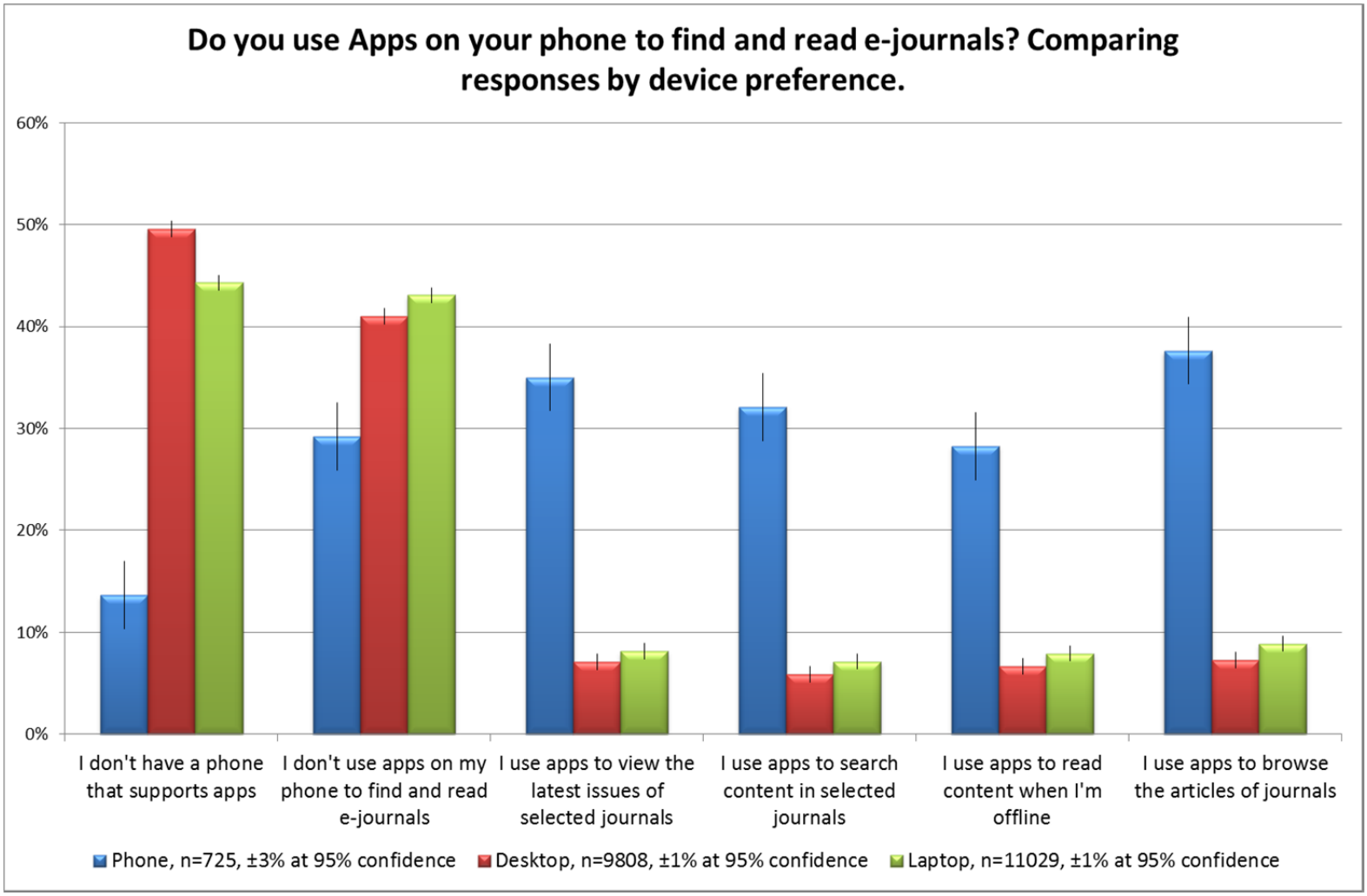


***Figure 80 - Comparing app use by device. Respondents who classified themselves as using device "All of the time" or "Most of the time" in survey.***

Those users who stated that phones were one of their primary devices do use apps extensively to access journals (and not just web browsers on their phones).

Those users who stated that their primary devices were laptops or desktops made some use of apps on their phones to access journals.

Note that it is perfectly possible for users that use phones to access journals to do this on a browser and yet not have the capability to use apps to access journals. There are 13% ±3% in this category.

## COMMENTS

Some of the comments for this question could give an indication as to why app use is so low. Some respondents commented they had an Android and

 

most apps were for iPhones. Others simply said that the phone screen was too small to view anything from a journal, or that the costs were too high to use their phone in this way. Others commented they were just not available: "*The fact that I don't use apps for this purpose is simply because the apps are not yet good enough, combined with not all apps being available in the iTunes store I shop in (my country or the US one), and roaming charges for using outside my small country."* And several people commented that the functionality just wasn't particularly good: *"I do a lot of reading on my iPhone (4), but I don't read journal articles for two reasons. First, it's a bother to enter log in credentials. Second, I don't have* an easy way to capture the text of the article and put it in *Instapaper (the app I use for long-form reading)*." For others, the problem was a bit more basic *"I'm the last person on the planet not to carry a phone with me."* Several people commented they weren't aware of any apps and were going to go and research them and others said that using a browser was good enough. Some respondents commented that whilst they didn't use apps on their phone they did indeed use apps on their tablet computer.

Where people do use apps, their uses are varied:

- *I use a pubmed search app I developed (pubsavvy) to search for articles on specific topics, across journals*
- *I use an App (Scholarley) to view articles from my Mendeley library*
- *I use an app to browse through journal alerts and RSS feeds that may contain links to new articles*
- *I use an iPod touch, which is technically not a phone, but it behaves like an iPhone (it's just that I'm using wifi, not 3G, to get the data). It is of course the same platform (iOS). I don't use special apps, just Safari for iOS. Sometimes I use Dropbox for iOS to look at a pdf I've already downloaded.*
- *I use an RSS reader app just for marking stars for google reader where I register keywords search results from scopus (by the way strictly it's not a phone: iPod touch)*
- *I use apps on my phone only when I need to read an e-journal article immediately and lack WiFi access for my tablet and/or laptop.*
- *I use apps once in a while to search, but read on the desktop later.*
- *I use apps to browse my bookmarked ejounals through Mendeley*
- *i use apps to find and read content but the source is not part of my initial search strategy. may get wiki, or class lecture or journal.*
- *I use apps to find but not read articles*
- *I use apps to read arXiv.org*

 

- *I use apps to read local, national, and world news and articles on specific subjects online*
- *I use apps to read the articles downloaded.*
- *I use apps to remotlly go through the databases when I study in a public space*
- *I use apps to search pubmed  I use apps to read articles saved*
- *I use apps to store articles and to compile bibliographies*
- *I use apps to take notes on jouurnal articles.*
- *I use apps to test out access to resources that we licence - how easy it is to authenticate to licensed resources. Very time-consuming as lots of issues and no time to report them and get them resolved. Would rather use databases such as Web of Science or Scopus and Google Scholar to get to the content. I sometimes promote them in classes with students on information literacy or whatever one wants to call it.*
- *I use apps to view hot articles*
- *I use apps when I really, really, really want to find a journal article, and it is the only computing device available.*
- *I use email on my phone to read emailed TOC alerts for journals, and very occasionally will click a link in the email to read an abstract or article in my phone's web browser.*
- *I use my Kindles to download and read many books and some journals. I do believe I am quite seriously in love with them (I have two).*
- *I use my phone mainly to read articles on the ArXiv*
- *I use my RSS feed aggregator*
- *I use Papers for iPhone to quickly check articles in conferences etc.*
- *I use pdf reader on my phone to view articles I have already downloaded.*
- *I use phone apps all the time to read articles previously uploaded/emailed to myself for that purpose. I never search for articles.*
- *I use phone apps for spontaneous searches*
- *i use phone for search the last articles of my favorite issues*
- *I use pubmed app to search articles. I use ipad to read pdfs of journal articles previously downloaded.*
- *i use safari to browse the web for journals. safari is an app, of course, but it's not one designed for browsing journals, if that's what you're asking about*
- *I use the "Papers" app for iPhone.*
- *I use the ArXiv app to follow the latest news, and I use google in the browser to find specific articles otherwize*
- *I use the pubmed mobile app*
- *I used Kindle but do prefer paper*
- *I used to use it while Nature was free.*
- *The app I use is Mendeley (so my own library and groups that I subscribe to)*

 

# PUBLISHER WEB SITE FEATURES

In the survey, respondents were invited to indicate which features, of a selected list of features of publisher web sites, they found useful. These features are the same as those tested in 2005 and 2008 to allow for direct comparison, and do not specifically test some more modern inventions, such as faceted browse/search.

Respondents could tick all the items they found useful. Some features scored very highly indeed, for example 75% of Social Scientists answering this question rated ToC alerts as useful.

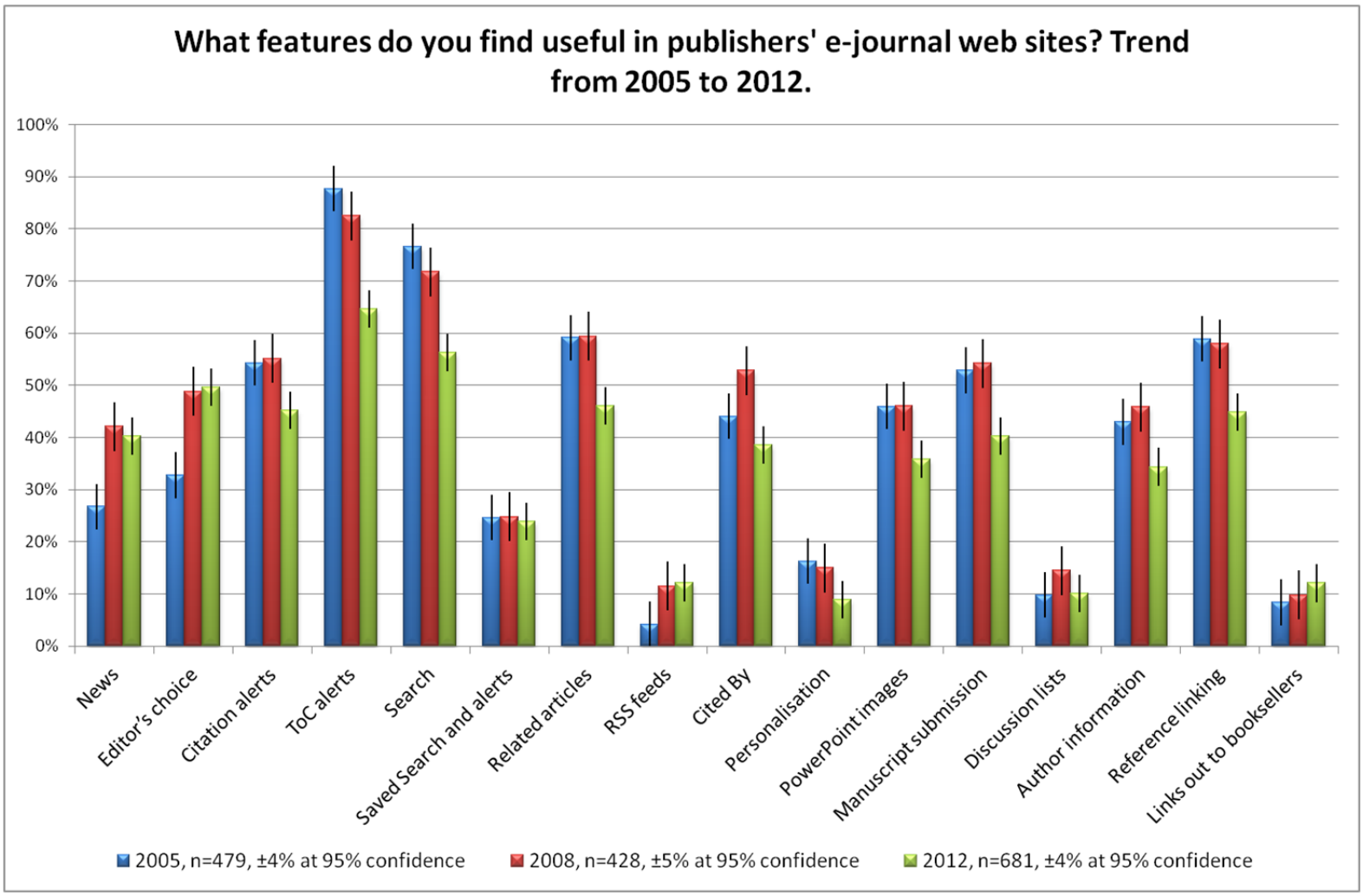


*Figure 81*

A sample of the 2012 data was taken at random in the broad proportions of region and subject area seen in the 2008 research and the results for this set compared with the 2005 and 2008 results. This can show us the trends

over time but cannot be taken as an indication of behaviour on a global or indeed pan-subject area basis.

It is perhaps not surprising that the popularity of many publisher web site features has declined in the last four years. Many of the innovations in article discovery are not on the publisher web site but rather in external discovery resources. It is now well understood that the reader predominantly interacts with the publisher site at the article level and so perhaps the opportunity for engaging with many of the features of the publisher web site has been reduced. Of note is that news and editor's choice have maintained their ground along with saved search alerts and RSS, although they are relatively still less important than other features.

### Comparison by Job Role

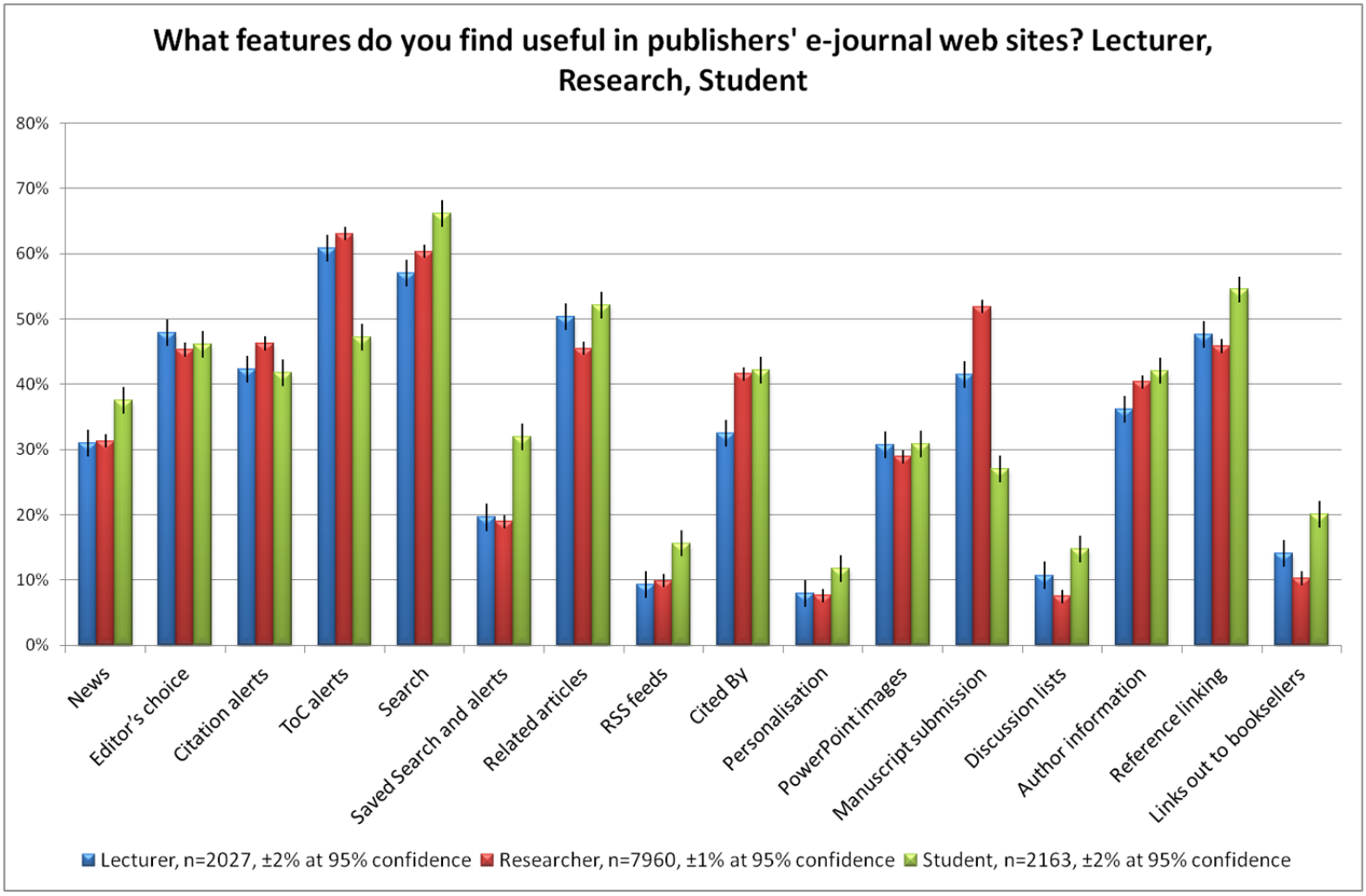


*Figure 82*

Within the academic sector we can see that students are making more use of news, search, search alerts and reference linking than their more senior

counterparts. Naturally researchers make the most use of manuscript submission. Lecturers are not the primary users of any feature, not even PowerPoint images.

## COMPARISON BY SUBJECT

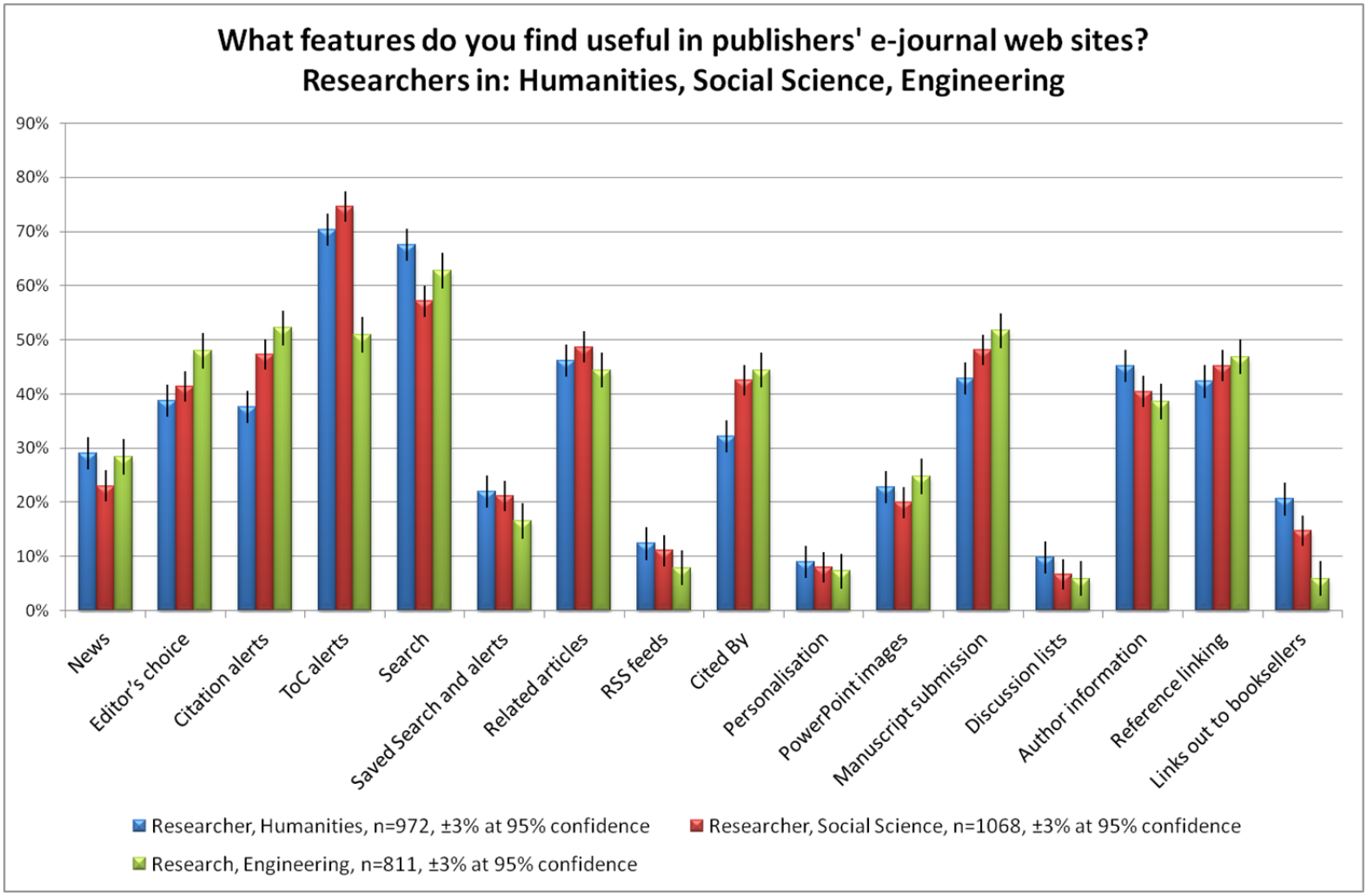


***Figure 83***

Social Scientists and Humanities researchers show some considerable differences in their approach to a number of web site features, notably Search, Cited By and Citation Alerts. Social Scientists make more use of the citation features while Humanities Researchers make more use of search instead.

Researchers in Humanities and Social Science make more use of links out to booksellers.

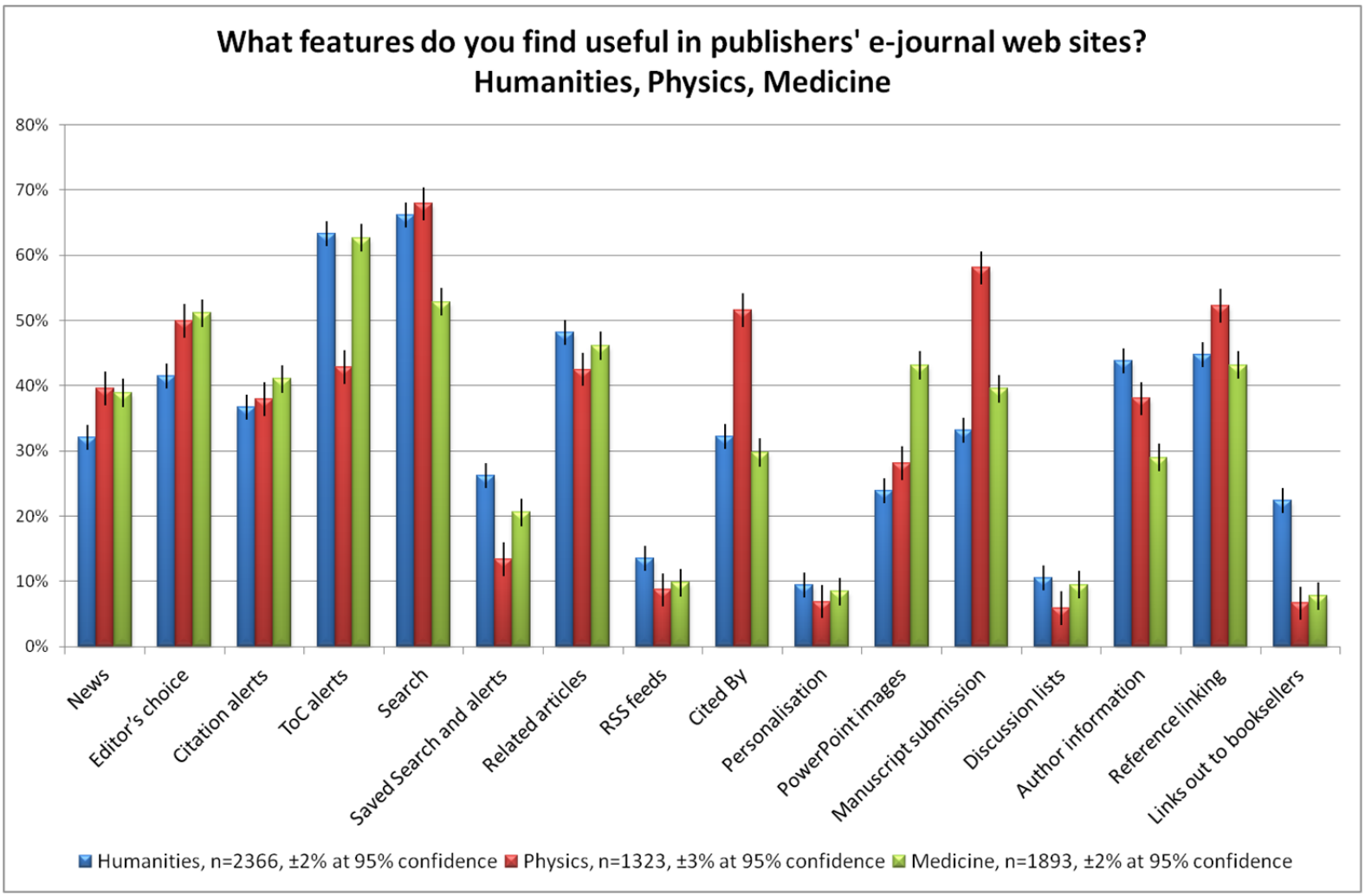


***Figure 84***

Physicists show a significant use of Cited-By functionality, but very much less of ToC alerts than those in Humanities or Medicine. The results show again that PowerPoint images are greatly used by those in Medicine.

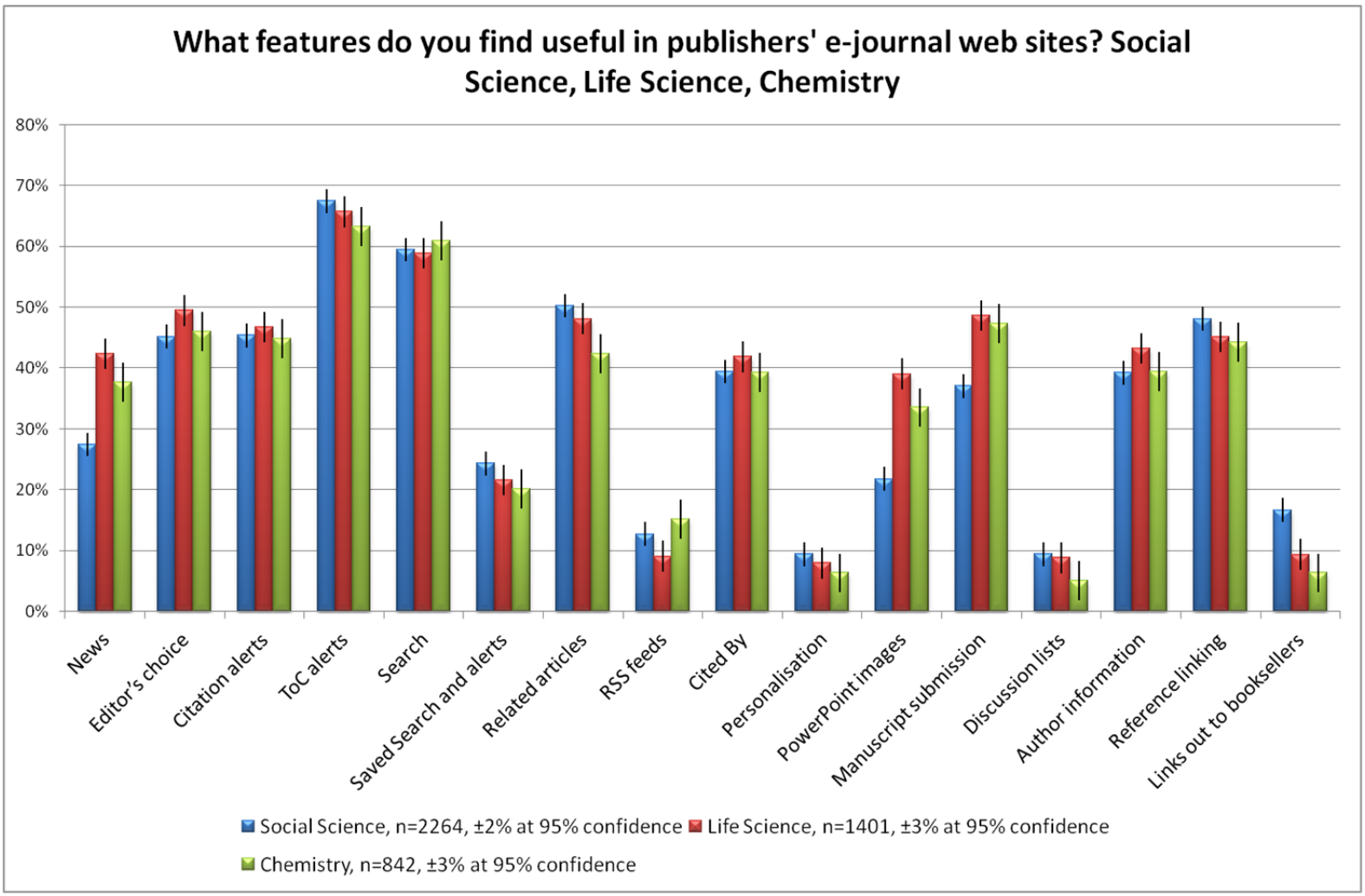


*Figure 85*

Life Scientists and Chemists value the ability to download images in articles in PowerPoint format more than Social Scientists do. As noted earlier, Social Scientists make more use of links out to booksellers, but otherwise not significantly more use of any feature. Chemists are less interested in "Related Article" features – perhaps these functions don't work as well with chemical formulae.

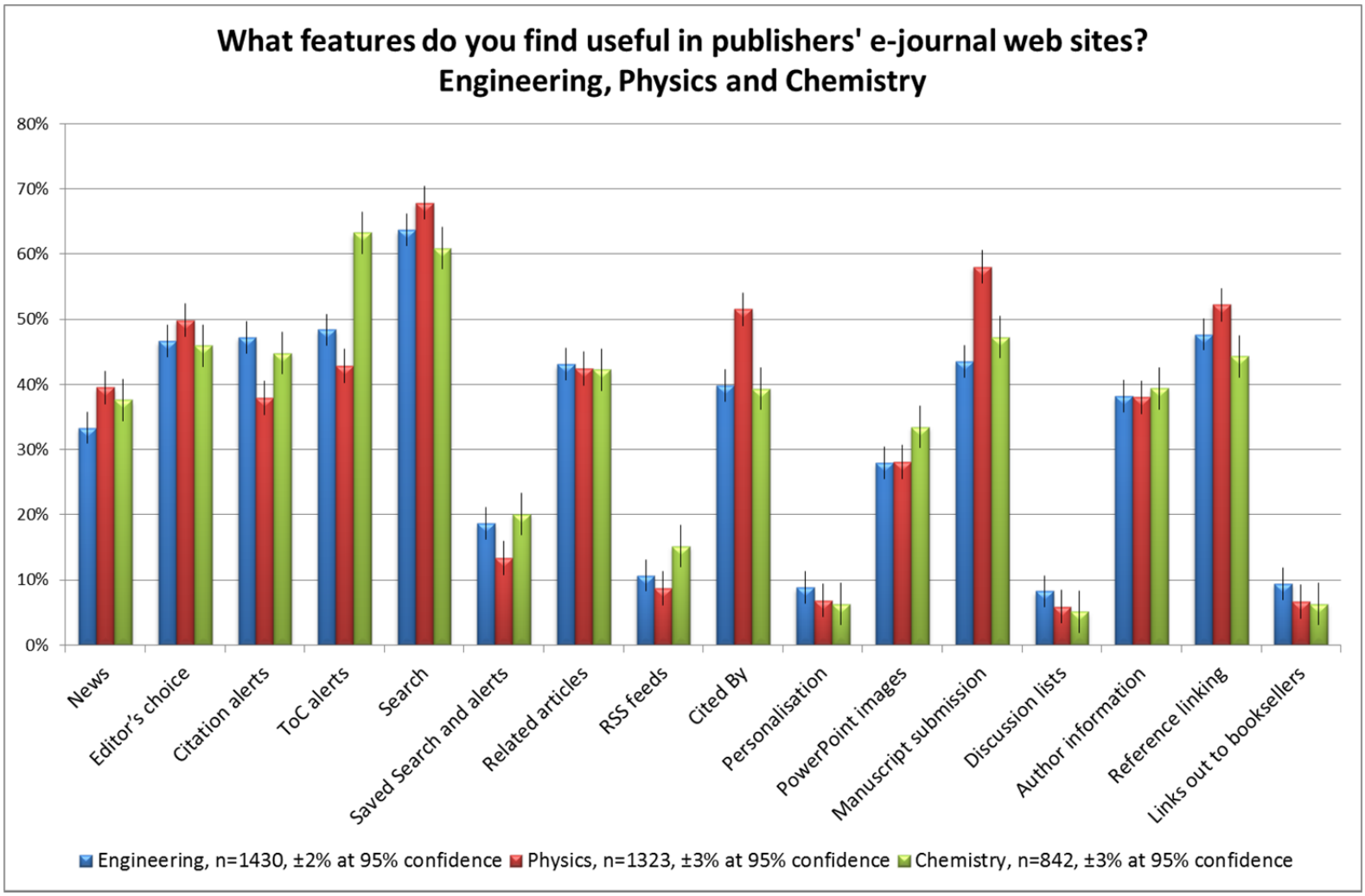


*Figure 86*

Chemists consider ToC alerts to be of much greater value than do Physicists and Engineers, and this may be due to the nature of these alerts, containing structures and formulae, not just a textual ToC. Physicists value Cited-by and Manuscript submission more highly.

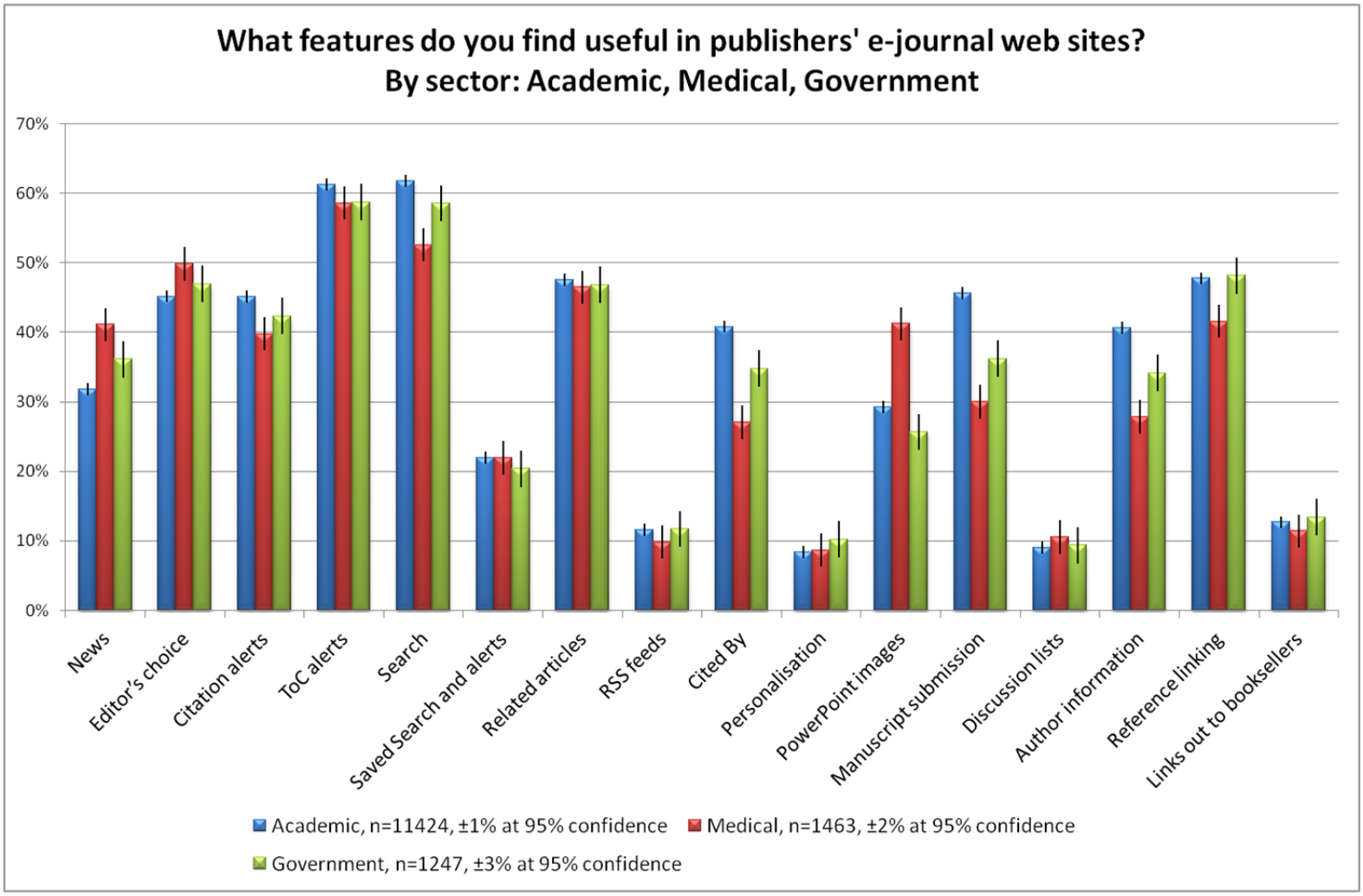


*Figure 87*

There are some considerable differences in behaviour between these sectors. Medics make by far the greatest use of PowerPoint images and are marginally more interested in News; however they have less interest in Search on the publisher web site (probably because of PubMed). Presumably due to of the number of medical practitioners as part of the sample, they show lower inclination towards manuscript submission and author information. The academics are much more driven by citations and author-side features.

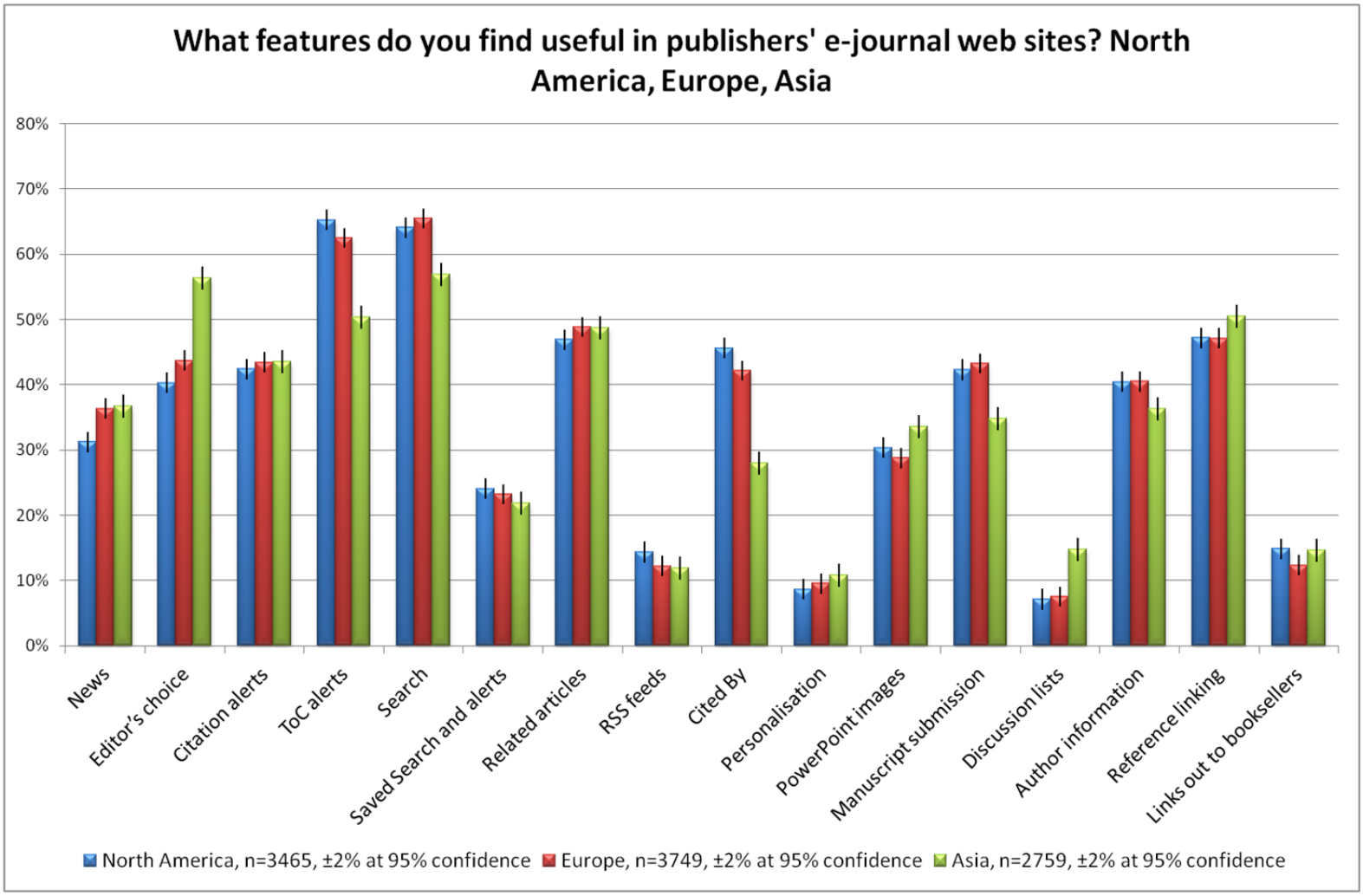


***Figure 88***

North America and Europe show very similar attitudes to publisher web site features, however there are significant differences when looking at the Asian market. In Asia, respondents value the Editor's Choice more than in other regions, but made use of alerting features less.

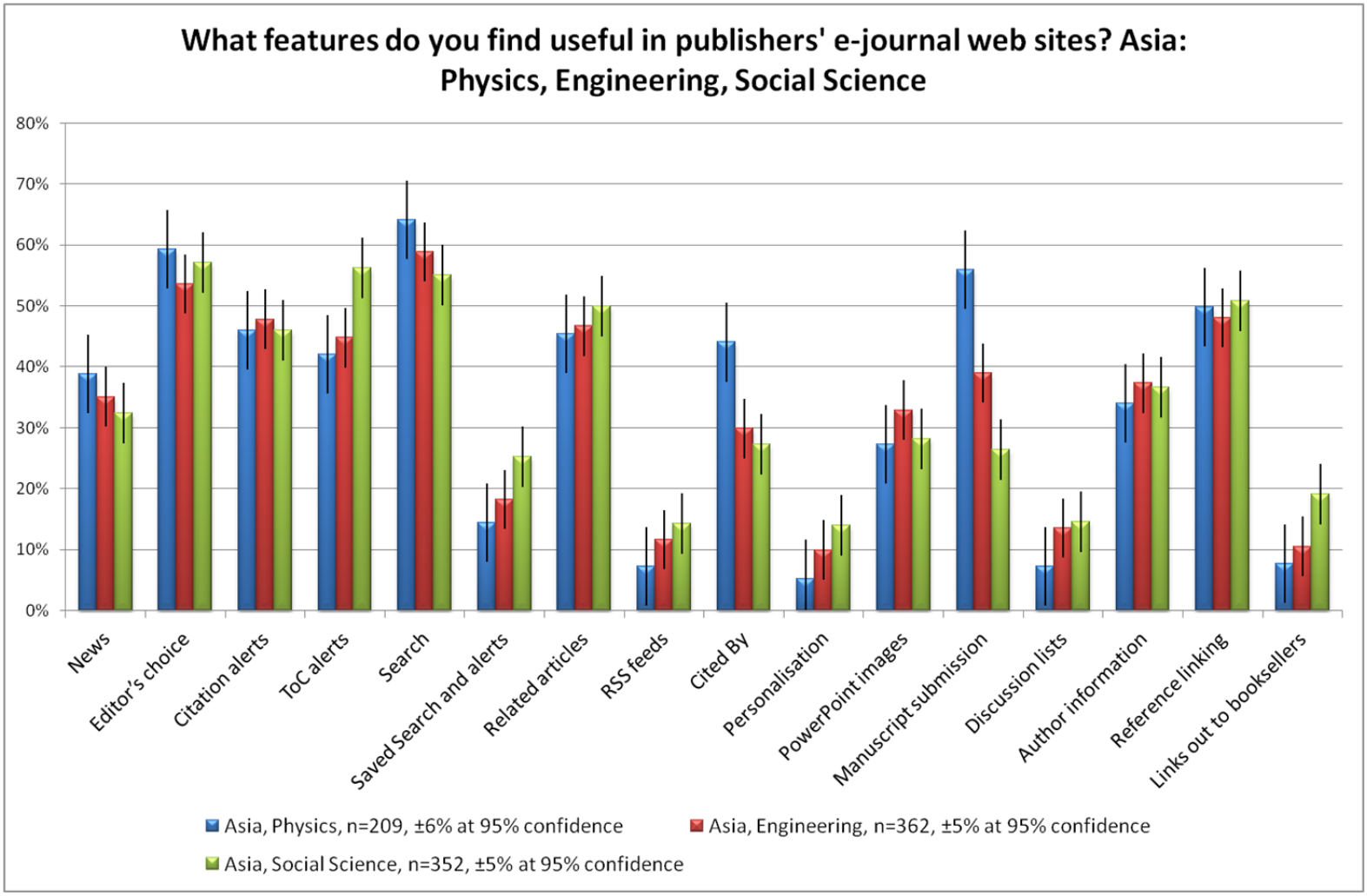


*Figure 89*

Within Asia, the relative importance of Cited By and Manuscript Submission for Physicists mirrors that found elsewhere in the world. Given the overall sample sizes, the error bars in this study are quite large, however there is still a significant difference in ToC alert behaviour for Social Scientists.

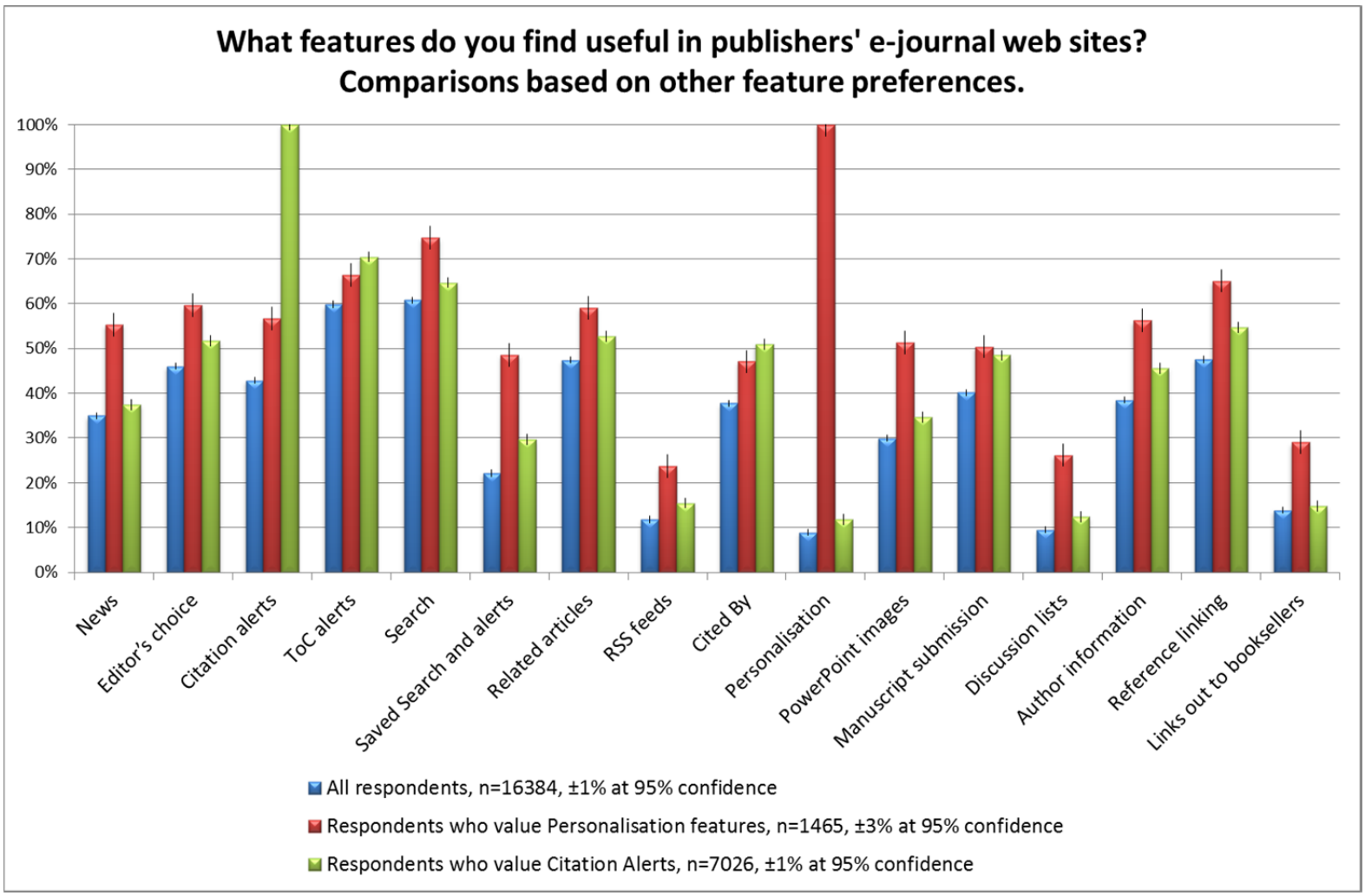


***Figure 90***

In this chart we test to see how groups of respondents who express a preference for a feature rate the other features of publisher web sites. The chart shows the data for those who value Personalisation features and Citation Alerts and plot the results against the entire caucus of respondents. (Note that the chart includes the obvious statements "100% of people who value Personalisation value Personalisation" and "100% of people who value Citation Alerts value Citation Alerts".)

Respondents who value Personalisation appear to be generally more engaged with every feature than the group of all respondents.

Respondents who value Citation alerts also appear to be generally more engaged with every feature than the group of all respondents apart from Links out to booksellers.

# CONCLUSIONS

It is widely acknowledged that readers arrive on publisher web sites from a discovery resource at the article level, and for a few years now publishers have been building web sites that expose vital functionality to the reader on that landing page. However, search on the publisher web site is persistently popular, not just on external discovery platforms, and indeed the number of readers who bookmark key pages in publisher web sites, or simply remember them, shows that publishers need to keep a multitude of navigational paths open to their readers. Moreover, this research shows that the relative importance of all of these paths vary from subject to subject, from region to region, and by job function. Multidisciplinary publishers need to take special note of keeping an open mind to reader navigation while perhaps more specialist ones could take a more decisive approach.

A key measure of publisher success is the usage of its e-journals, which can be maximised by influencing and enabling all the routes to its content. Library technology plays a key role in user navigation, as well as the more apparent starting points such as Google or major subject A&I databases.

Publishers need to support all conceivable routes to their content through the web. This can best be achieved through the distribution of XML header information to as many discovery platforms as possible, through RSS feeds, collaboration with CrossRef, library technology vendors and through working with major gateways, A&Is and search engines.

As metadata distribution is maximised and users are able to choose more freely their preferred routes to content, many of the advanced features that users require seem to be migrating to their chosen discovery platforms leaving the publisher site ever more as a content silo, without the need for quite so many of the advanced features that are currently present there. However, publishers remain under pressure to maintain a high level of functionality to ensure that they engage with content buyers, authors and editorial boards.

 

# About the Authors

**Simon Inger** has worked in the journals industry for over twenty-five years. In this time, he has worked for Blackwell, CatchWord, Ingenta and, since 2002, as an independent consultant. Simon was Founder and Managing Director of CatchWord Ltd, the world's largest e-journal platform of the time, from its inception in 1995 to its sale to Ingenta in 2001. Simon has worked extensively in journal sales, marketing and pricing; e-journal delivery and platform selection; fulfilment and editorial systems selection; business reviews; management; financial planning; product development; market research; content development; and library technology. In addition, he runs training courses for librarians in the UK and Ireland on e-journal technology and management, as well as courses for publishers on best practice in e-journal dissemination. Simon's clients include societies, university presses and commercial publishers from across Europe and North America.

**Tracy Gardner** has over fifteen years' experience in marketing and communications. She has a very broad view of the industry having worked for publishing technology companies (CatchWord and Ingenta), a not-for-profit publisher (CABI Publishing) and a consultancy company (Scholarly Information Strategies) where she worked on various projects for publishers, intermediaries and libraries. Throughout her career she has been focussed on improving the communication channels between publishers, intermediaries and librarians and understands the business of scholarly publishing from many different perspectives. She now has her own company and offers consultancy and training services to those involved in the scholarly publishing industry. Tracy has been a co-trainer on UKSG's E-Resources Technical Update course since the beginning of 2007.