

## Is What's "Trending" What's Worth Purchasing?: Insights From a National study of Collection Development Librarians

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New forms of data like altmetrics are helping librarians to make smarter decisions about their collections. A recent nationwide study administered to librarians at R1 universities shines light on exactly how these metrics are being applied in academia. This article is based on a presentation from the NASIG 31<sup>st</sup> Annual Conference. It includes survey results addressing previously unknown rates of technology and metrics uptake among collection development librarians, the most popular citation databases and altmetrics services being used to make decisions, and surprising factors that affect attitudes toward the use of metrics.

**KEYWORDS** altmetrics, bibliometrics, collection development, selection criteria, survey

Altmetrics are a hot topic in libraries, but little is known about how they are actually being put to use by librarians in their day-to-day work. Only a handful of studies to date have attempted to answer this question, and no clear answers have been found as to how academic librarians from across the United States tend to use altmetrics in comparison with other research impact metrics.<sup>1</sup>

For this reason, a survey was conducted in the US to understand how academic librarians are using research impact metrics like the journal impact factor, usage statistics, and altmetrics in

the course of their jobs. For the purposes of this paper, we focus upon the use of various impact metrics among collection development librarians.

This paper describes the various research impact metrics in use in academic libraries and shares the results of a survey of academic librarians employed at Carnegie-classified “research intensive” (R1) universities. It will examine the respondents’ levels of awareness of research impact metrics, describe how they are using these metrics in their regular job responsibilities, and share the tools and technologies used to collect various metrics. The concluding discussion will describe relationships found between librarians’ duties, their familiarity with each type of metric, and their use of these metrics for collection development.

### **Measures of Research Impact**

The Journal Impact Factor (JIF) is a proprietary metric developed by the Institute for Scientific Information (now Thomson Reuters). It is a quantitative tool “for ranking, evaluating, categorizing, and comparing journals” and measures “the frequency with which the ‘average article’ in a journal has been cited in a particular year or period.”<sup>2</sup> It is a more complex measure of journal-level impact than raw citation counts, which are simply the number of times that an article, book, or other research output like data or software (or a collection thereof, e.g. all articles published in a journal) has been cited in a journal article or book. Unlike the JIF, citation counts can be applied at both the item level and the journal level, although they are most commonly applied at the item level.

Usage statistics are defined as the frequency with which articles from a particular journal have been downloaded or viewed and are most often reported at the journal level, although they can exist at the article level as well. Usage statistics are reported similarly for e-books. The Journal Usage Factor (JUF) is a relatively new, data-based metric for measuring journal impact.

It was introduced by the COUNTER organization in 2015 and is intended to parallel the JIF.<sup>3</sup>

Altmetrics are a new type of metric that is complementary to more traditional measures. They measure the volume and nature of the attention that research receives online. Anything that can be text mined online is potentially an altmetric, including social media mentions, news articles, or citations in public policy documents. Altmetrics are understood to be complementary to traditional, citation-based metrics: they are quicker to accumulate and can tell us about the use of research among more audiences than a scholarly audience alone.<sup>4</sup>

Although altmetrics as a concept has existed for more than five years, little research has been conducted to find out how librarians are actually using altmetrics. Speculation, on the other hand, abounds. This lack of empirical data formed the impetus for the current study, in which the authors used a survey to gather evidence on how altmetrics and other traditional impact metrics like the impact factor are being used by academic librarians.

### **Methodology**

The population for the survey was determined using the 2013 National Center for Education Statistics list of Carnegie-classified “R1” (research intensive) institutions in the United States. The authors manually collected email addresses for librarians at each institution and made attempts to weed out staff like student workers and administrative assistants. The resulting population included 13,436 librarians from 150 institutions. Using this manually curated email list, the authors distributed a thirty-one question survey and received 707 responses, a 5.3 percent response rate.

The authors obtained initial descriptive statistics of our sample of academic librarians using Qualtrics survey software, which was used to administer the survey. Data was then exported for further analysis in both Excel and SPSS Statistics.

Survey questions addressed topics including:

- the participants' regular (occurring once per month or more often) and occasional (at least once per year and less than once per month) job responsibilities,
- their levels of awareness of traditional and new measures of research impact, and
- how they were using various research impact measures.

Many of the survey questions were expressed in terms of a Likert scale ranging from “I know nothing” to “I’m an expert” on the metric in question. This approach resulted in categorical data. Thus, the authors used non-parametric tests like the chi-square test of independence to identify relationships between variables. Given the small response rate our survey received, our data did not allow for testing the representativeness of our sample of librarians to the larger population, so the results below should not be generalized to the larger population.

## Findings

### Demographics

Over half of the survey respondents had been on the job for more than eleven years, with over a third having more than twenty years' experience. Twenty-two percent of the respondents had been on the job for six to ten years and eighteen percent had been on the job for one to five years. Respondents were also asked to choose from a list the duties for which they had regular responsibilities (Table 1).

Regular duty	Percentage of respondents
Collection development	74%
Instruction	64%
Assessment	59%
Reference services	46%
Scholarly communication support	39%

Note: respondents had the opportunity to choose more than 1 regular duty.

Table 1. Respondents' Regular Duties

The largest number of respondents, 74 percent, had regular collection development duties (defined as selecting and purchasing books, journals, etc. for faculty and students). More than half of the respondents had regular duties related to instruction (64 percent), defined as teaching workshops and one-shot instruction sessions and/or assessment (59 percent), defined as gathering and reporting statistics and qualitative studies to understand the success of library-based resources and programs. Less than half had regular duties related to providing reference services (46 percent), defined as staffing the reference desk, answering reference questions via email and one-on-one consultations and/or scholarly communication support (39 percent), defined as helping faculty and students choose research software, tools, and which journals to publish in and helping scholars to measure research impact.

Respondents were also asked about their tenure status (Table 2). Forty-six percent of the respondents who answered this question were either tenured (33 percent) or on the tenure track (13 percent) while 54 percent of the respondents who answered this question were not in a tenure track position or were working at an institution that did not offer tenure status for librarians.

Tenure status	Percentage of respondents
Yes, I'm on the tenure track	13%
Yes, I have tenure	33%
I do not have a tenure track position	16%
My institution does not offer tenure status for librarians	38%

Table 2. Respondents' Tenure Status

### **Familiarity with Research Impact Metrics**

Respondents were asked to rate their familiarity with various research impact metrics on a scale of one to five, where one represented “I know nothing” and five represented “I’m an expert.” Sixty-eight percent of the respondents who replied to this question reported high levels of familiarity (i.e. selected four or five on the scale) with citation counts, 65 percent were similarly familiar with usage statistics, and 55 percent were similarly familiar with the JIF. However, only 27 percent reported high levels of familiarity with altmetrics. The difference between librarians’ familiarity with altmetrics and their familiarity with JIF, usage counts, and citation counts is statistically significant ( $\chi^2(4, n = 578) = 70.4, p < .01$ ;  $\chi^2(4, n = 567) = 100.95, p < .01$ ; and  $\chi^2(4, n = 567) = 115.72, p < .01$  respectively). From Figure 1, it would appear that the librarians who participated in the survey are less familiar with altmetrics as a measure of research impact than they are with more traditional measures of research impact.

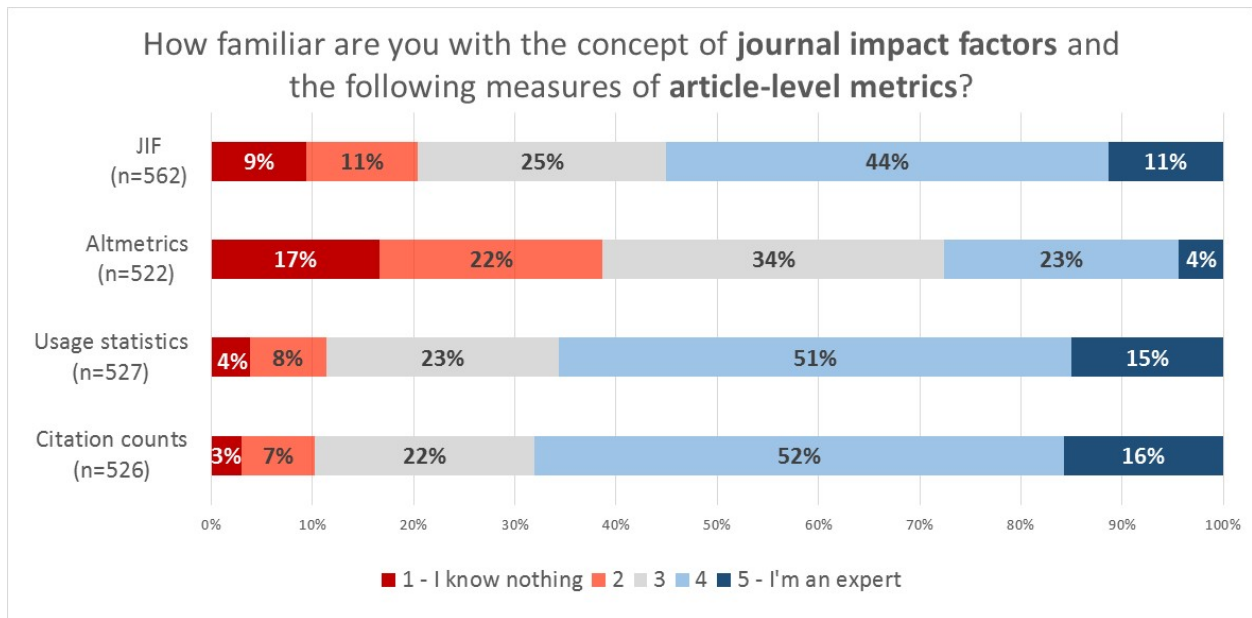


Figure 1. Familiarity with Measures of Article Level Impact

Next, the authors tested for a relationship between having regular responsibilities in certain areas and respondents’ levels of familiarity with research impact metrics. There is a statistically significant relationship between familiarity with JIF and all of the regular job

responsibilities the authors asked about (collection development:  $\chi^2(4, n = 563) = 24.187, p < .01$ ; instruction:  $\chi^2(4, n = 563) = 40.56, p < .01$ ; reference:  $\chi^2(4, n = 573) = 37.77, p < .01$ ; scholarly communication:  $\chi^2(4, n = 563) = 64.01, p < .01$ ; assessment:  $\chi^2(4, n = 563) = 12.57, p < .05$ .) As is illustrated in Figure 1, familiarity with various research impact metrics was rated on a scale of one to five, where one represented “I know nothing” and five represented “I’m an expert.” Based on this finding and the data describing familiarity with JIF, those librarians with regular collection development, instruction, reference, scholarly communication, and assessment duties are likely to be more familiar with JIF than those who do not regularly perform those duties.

There is also a statistically significant relationship between familiarity with citation counts and each of the other regular job responsibilities the survey asked about (collection development:  $\chi^2(4, n = 526) = 11.16, p < .05$ ; instruction:  $\chi^2(4, n = 526) = 28.27, p < .01$ ; reference:  $\chi^2(4, n = 526) = 17.88, p < .01$ ; scholarly communication:  $\chi^2(4, n = 526) = 53.09, p < .01$ ; assessment:  $\chi^2(4, n = 526) = 10.1, p < .05$ .) Based on this finding and the data describing familiarity with citation counts, those librarians with regular collection development, instruction, reference, scholarly communication, and assessment duties are likely to be more familiar with citation counts than those who did not indicate that they regularly perform those duties.

The data required for testing for a relationship between tenure status and levels of familiarity with measures of research impact were such that they did not meet the assumptions of the statistical tests when split into the original four categories of tenure status (“tenured,” “on the tenure track,” “not in a tenured position,” and “not at an institutions offering tenure to librarians”). To work around this, the authors collapsed the categories from four to two: “tenured or on the tenure track” and “not tenured or not on the tenure track.” Our respondents’ replies to

the question of familiarity broken down by these two categories of tenure status are illustrated in Figure 2.

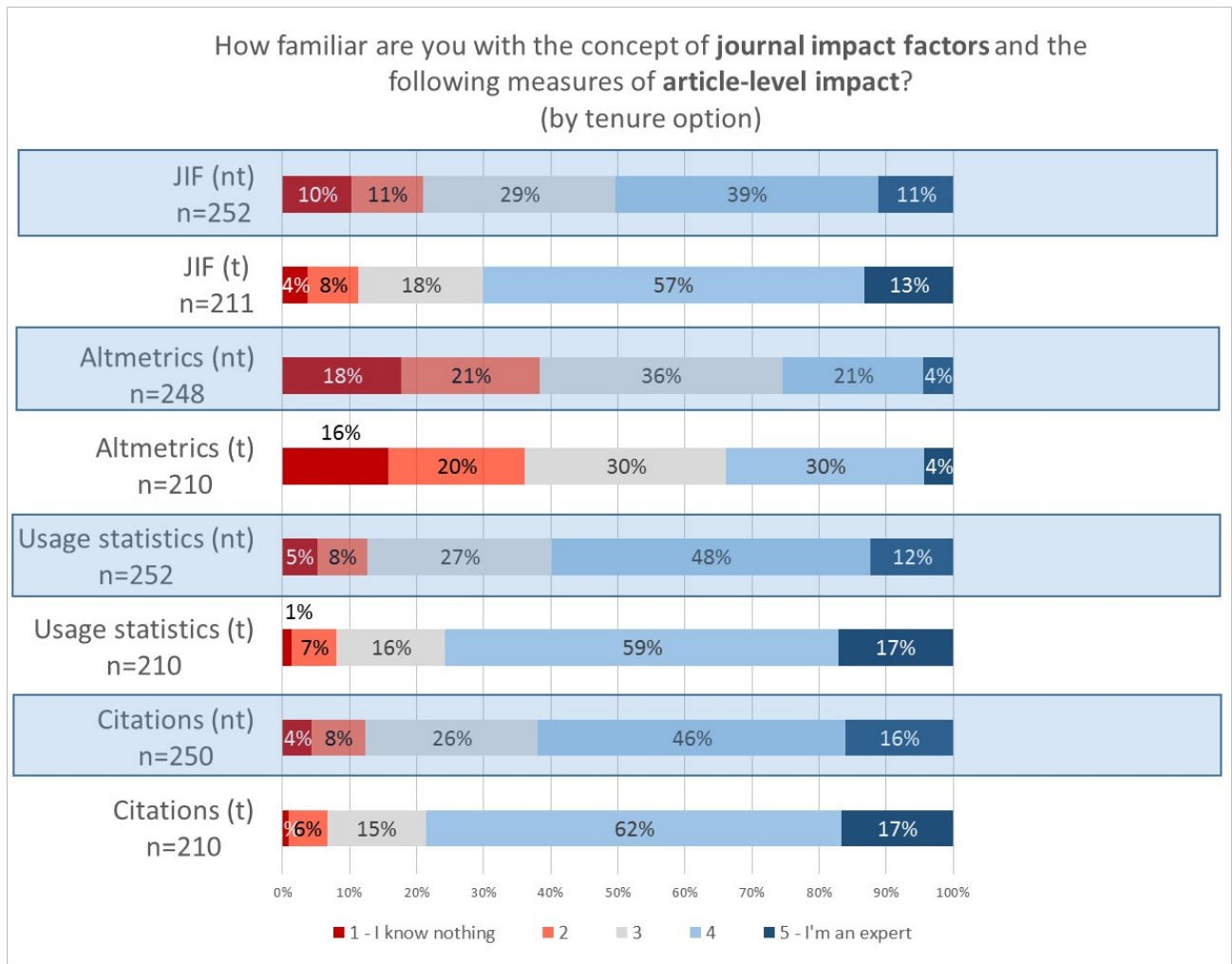


Figure 2. Familiarity with Impact Measures by Tenure Status

Our results indicate a statistically significant relationship between tenure status and familiarity with JIF ( $\chi^2 (4, n = 463) = 20.7, p < .01$ ), usage statistics ( $\chi^2 (4, n = 462) = 15.62, p < .01$ ), and citations ( $\chi^2 (4, n = 460) = 17.6, p < .01$ ), but no statistically significant relationship between tenure status and familiarity with altmetrics ( $\chi^2 (4, n = 458) = 4.976, p > .01$ ). Based on this finding and the data describing familiarity with JIF, usage statistics, and citations, those librarians who are tenured or on the tenure track are likely to be more familiar with JIF, usage,



and citations than those who don't regularly perform those duties. The lack of a statistically significant relationship between tenure status and familiarity with altmetrics may result from altmetrics rarely being included in promotion and tenure guidelines, which often have a heavy reliance on JIF and citation counts. The tenure and promotion process has perhaps not yet been influenced by altmetrics, and while other factors (such as one's regular duties) might have influenced our respondents' familiarity with altmetrics, tenure is still based on a system that has been slow to adopt new measures of impact.

Finally, the authors wondered whether there might be a relationship between familiarity with measures of research impact and years of experience as a professional librarian. As with the data for tenure status, the original data for years of experience did not meet the assumptions of the statistical tests. Unfortunately, in this case, no amount of manipulation, e.g. collapsing categories, could be applied to correct for this and so the results for this question are inconclusive.

### **Use of Research Impact Metrics**

The survey asked respondents about the ways that they were using research impact metrics and tested for relationships between their use of research impact metrics and their regular job responsibilities, tenure status, and years of experience. In particular, the authors were interested in whether the librarians in our study were using measures of research impact for collection development, and, if so, which measures were preferred.

First, the authors considered the frequency with which respondents use indicators of research impact for collection development. In response to the question, "How often do you evaluate materials using the following measures of research impact in the context of your collection development duties?", the responses revealed that when it comes to collection

development, altmetrics are not often considered. Forty-six percent of librarians never use altmetrics, but that trend was not limited to altmetrics alone. Among the types of metrics the authors asked about, “I rarely use this metric” or “I never use this metric” was the most common answer. The metric that librarians are most likely to use in the practice of collection development “often” or “very often” is usage statistics. These results are illustrated in Figure 3.

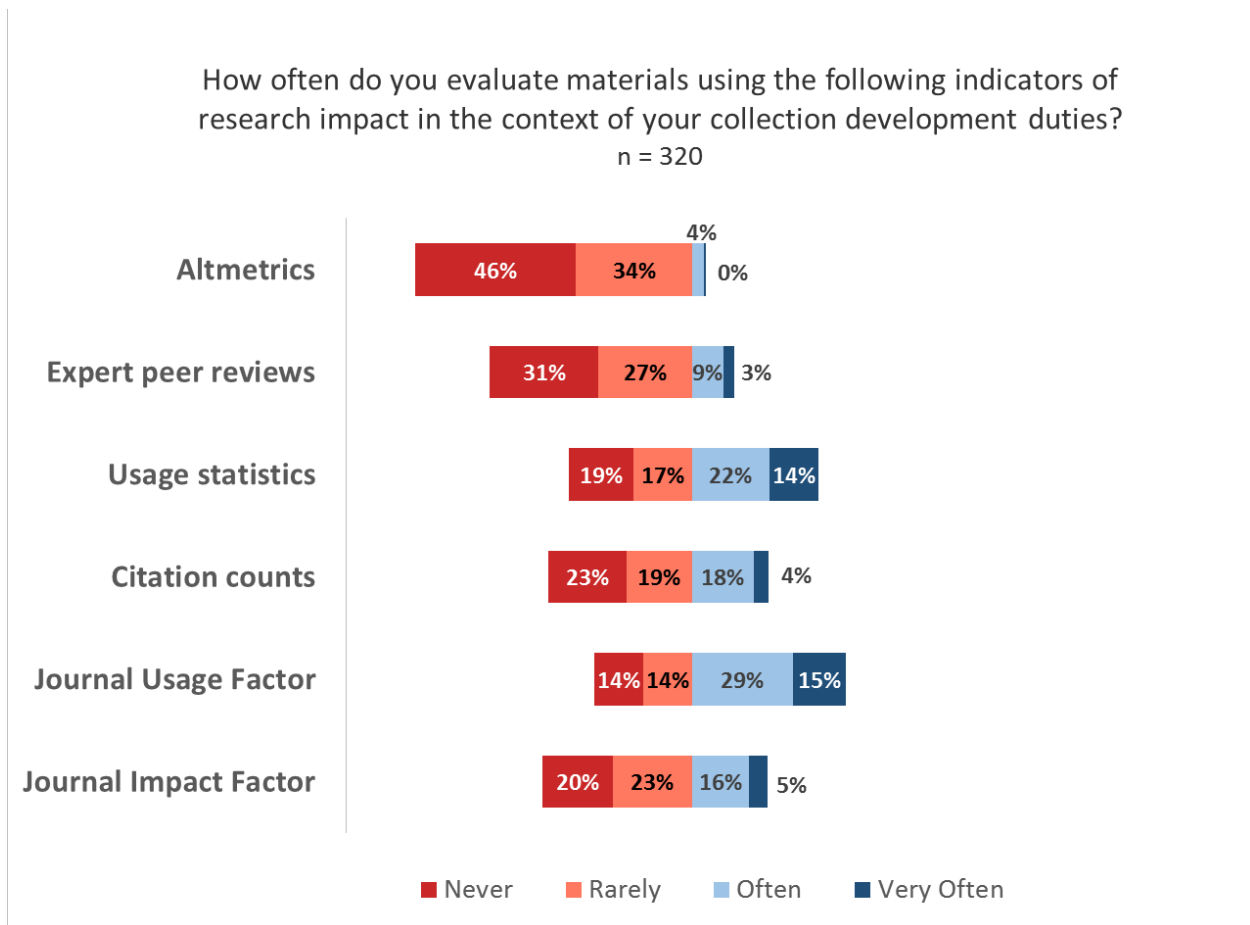


Figure 3. Use of Indicators of Research Impact for Collection Development

There were no statistically significant relationships between respondents’ tenure status and the frequency with which they used research impact metrics in the course of their collection development responsibilities. The data required to test for a relationship between the use of research impact metrics and years of experience did not meet the assumptions of the chi-square

test of independence. As such, a relationship was undetermined. However, based on descriptive data (Figure 4) and the lack of a relationship between use of research impact metrics and tenure status, the authors conjecture that there is also no a relationship between librarians' years of experience and how often they use indicators of research impact for collection development.

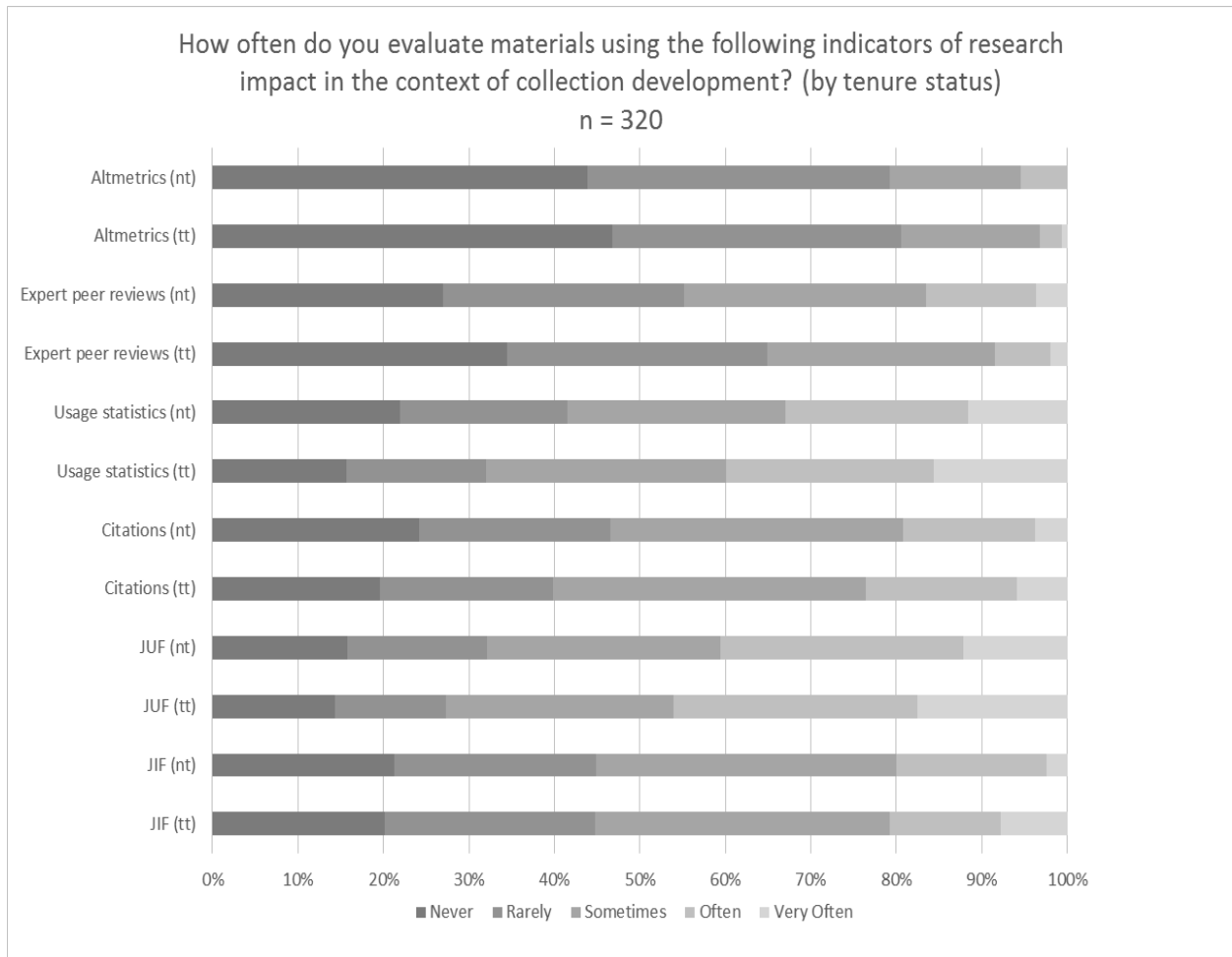


Figure 4. Use of Research Impact Metrics for Collection Development by Tenure Status

The survey data indicate a statistically significant relationship between the frequency with which our respondents used metrics for collection development and their having regular responsibilities for scholarly communication (JIF:  $\chi^2(4, n = 320) = 22.47, p < .01$ ; JUF:  $\chi^2(4, n = 320) = 20.28, p < .01$ ; citation counts:  $\chi^2(4, n = 315) = 16.61, p < .01$ ; downloads and page views:  $\chi^2(4, n = 318) = 13.64, p < .01$ ; expert peer reviews:  $\chi^2(4, n = 318) = 16.145, p < .01$ ; altmetrics:  $\chi^2$

(4,  $n = 319$ ) = 30.94,  $p < .01$ ). Based on this finding and the data describing use of metrics for collection development, those librarians who have regular scholarly communication responsibilities are more likely to use them for that purpose than those who don't regularly perform those duties. From Figure 5, the authors concluded that librarians with regular responsibilities for scholarly communication were most likely to use the JUF and usage statistics in the practice of their collection development responsibilities. Twenty percent of respondents use the JUF "very often" and 19 percent of use usage statistics "very often." In the case of all of the metrics except altmetrics and expert peer reviews, the percentage of respondents indicating they had more familiarity with the metrics are greater for librarians with regular scholarly communication responsibilities than for the total of our respondents as a whole (both those with and those without regular scholarly communication responsibilities). This supports the conclusion that regular scholarly communication responsibilities promote familiarity with and use of the more traditional metrics (e.g. citation-based metrics and usage statistics) for collection development.

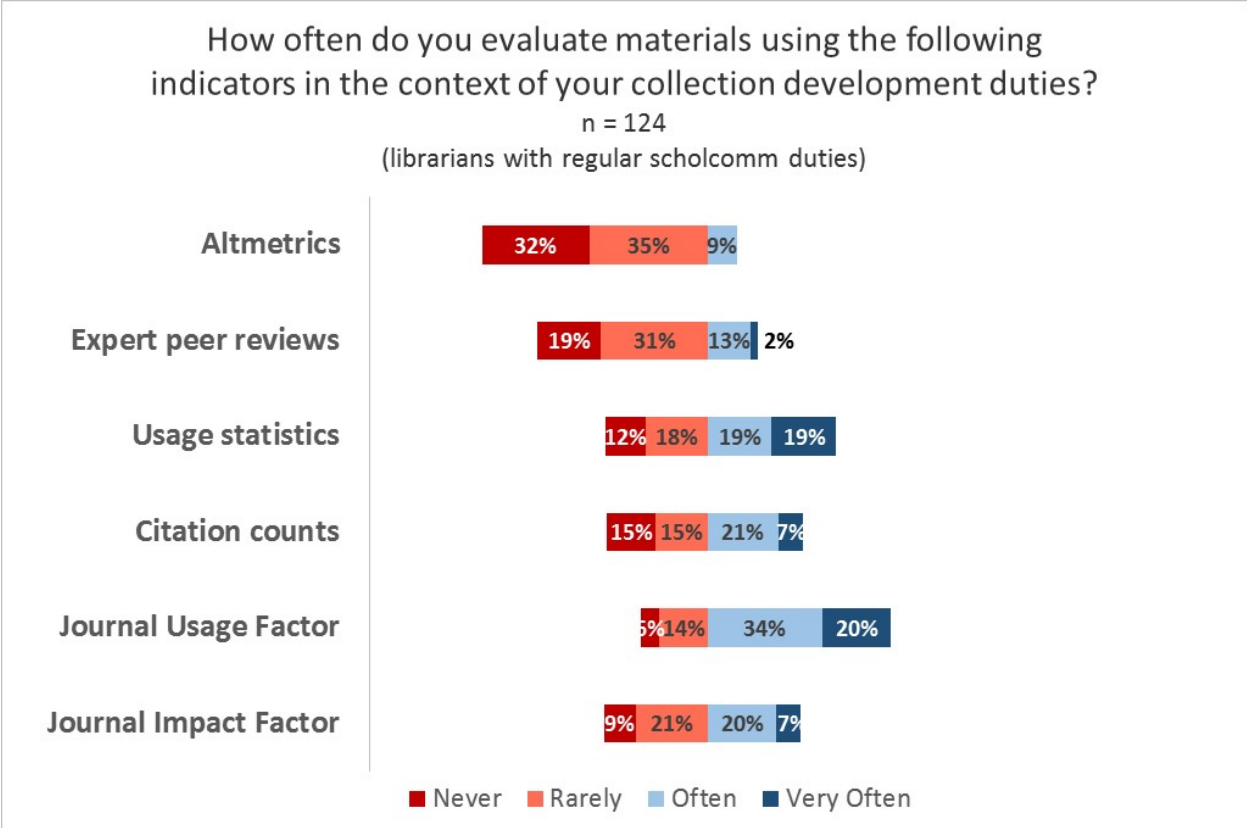


Figure 5. Frequency with which Metrics are used for Collection Development among Scholarly Communication Librarians

**Tools for Collecting Metrics**

The authors were interested in what tools librarians were using to collect metrics related to research impact and, of those tools, which were their favorites. Due to survey design, these questions were framed in the context of “compiling evidence of research impacts on behalf of a faculty member, department, or university administrator,” so it is not possible to draw conclusions about where respondents obtain evidence of research impact in relationship to their collection development duties. Nonetheless, the authors considered librarians’ preferred impact metrics tools a useful area to examine.

The authors compared the use of tools for compiling evidence of research impact by

librarians who had regular collection development responsibilities with the group of respondents as a whole. Figure 6 illustrates all respondents' choices for sources of research impact metrics. Although this is simply descriptive (no significance testing was applied), Web of Science is the clear leader, followed by Google Scholar and Scopus. Their relatively lower use of sources of altmetrics data from Altmetric.com, ImpactStory, and PlumX, supports the finding that among our respondents and in general, altmetrics are not yet being used with much frequency.

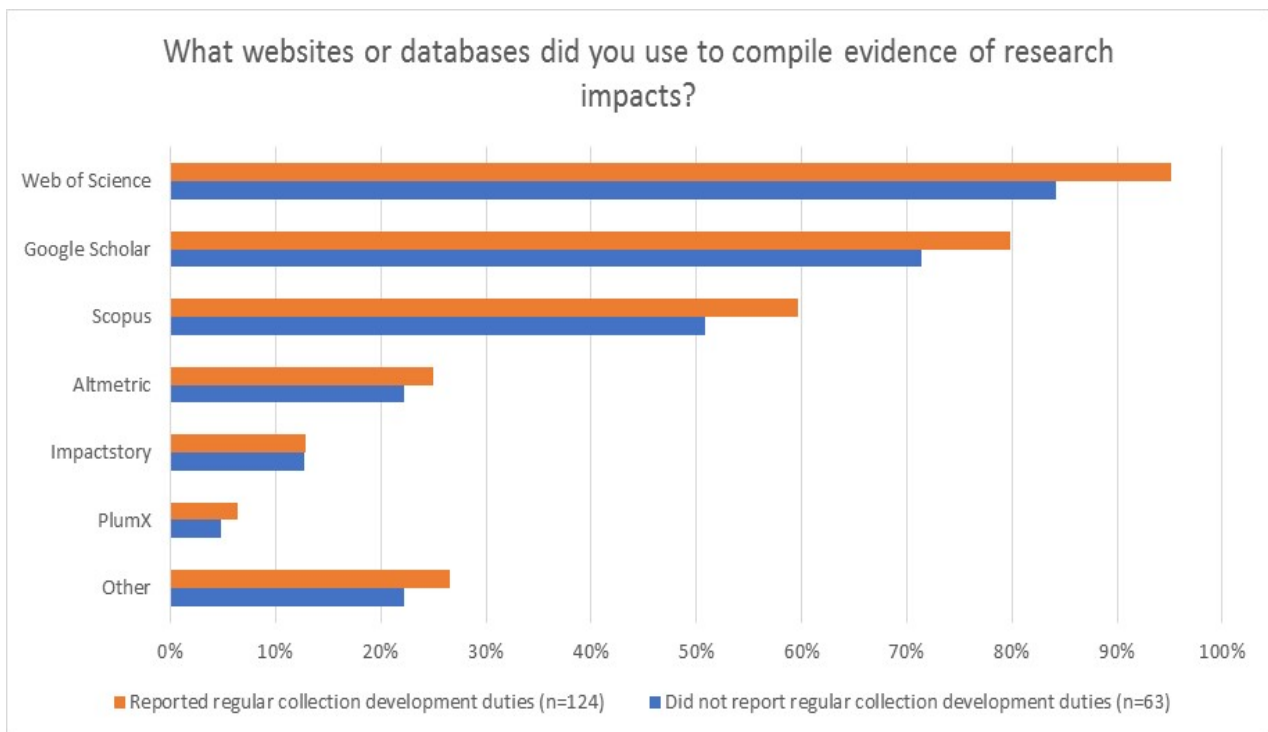


Figure 6. Tools Used for Compiling Impact Evidence

In addition to asking respondents about how often they used some specific sources for research impact metrics, the survey also asked them to share other sources of metrics they were using. Figure 7, a word cloud in which the size of the terms in the illustration reflects how often that term appeared in the data, depicts their responses. The size (and thus frequency) with which “Publish or Perish” (a tool for gathering citations based upon Google Scholar data) appears lends support to the idea that the promotion and tenure system guides academics’ familiarity with and

use of various research impact metrics. It is also interesting that several of the websites and databases whose names appear in the word cloud in Figure 7 (for instance, Mendeley) are the same measures that are incorporated into aggregated altmetrics data like those produced by Altmetric.com, ImpactStory, and PlumX.



Figure 7. Other Sources of Metrics

### Discussion

The existence of cases where the survey data did not meet the assumptions for statistical testing limits the generalizability of the results. Generalizability is also limited in some instances by low response rates to some questions. Nevertheless, the data and results discussed here suggest several previously undocumented conclusions.

Among the librarians who responded to the survey, there is a clear, statistically significant relationship between their familiarity with and use of research impact metrics. Respondents are more familiar with traditional metrics related to usage and citations, even when these data come from newer sources like Google Scholar, than they are with altmetrics.

Familiarity with traditional metrics is related to whether or not one is on a tenure track. However, familiarity with altmetrics is not related to tenure status. This may be the result of slow

uptake of altmetrics being used for promotion and tenure. With regard to the use of various measures of research impact, the librarians surveyed were most likely to use the Journal Usage Factor and usage statistics in the context of their regular responsibilities for collection development and least likely to use altmetrics.

There is a positive relationship between having regular responsibilities for scholarly communication and using research impact metrics for collection development responsibilities. This finding may seem intuitive to some readers, but this is the first study to formally identify such a relationship.

With regard to the sources from which the librarians in surveyed obtain research impact metrics, Web of Science (owned by Thomson-Reuters, publisher of the Journal Impact Factor as well as Journal Citation Reports) was the tool most often consulted for the purpose of documenting evidence of research impact in reports for faculty and administrators. While altmetrics as a whole were less likely to be used for this purpose, among the providers of altmetrics data, Altmetric.com seems to be the tool most often consulted for the purpose of documenting evidence of research impact using altmetrics.

### **Future Research**

As one of the first of its kind, this study was designed to be exploratory, with the aim of gathering additional data in future years. In future studies, the authors hope to resurvey the same population as studied in this paper (albeit using improved methods to yield more statistically significant results) and also to study a more international population of librarians.

As is often the case, the findings from this survey have led us to more questions. Some of the future work that may be done on this topic includes conducting interviews with academic librarians to gain additional insight into how and why collection development librarians choose



metrics to use for evaluating materials for potential purchase or lease. Future surveys may be able to track over time the growth of the use of altmetrics to make collection development decisions. The authors also expect to examine university promotion and tenure guidelines to learn more about the metrics that are documented therein.

## NOTES

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