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**Final Report on the Investigation into the  
Feasibility of Developing and Implementing  
Journal Usage Factors**

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**Note: Section 3b, which covers the web survey, is the work of Key Perspectives Ltd and has been incorporated into this final report.**

## 0. Executive Summary

The objective of this project was to obtain an initial assessment of the feasibility of developing and implementing journal Usage Factors (UFs). This was done by conducting a survey in two Phases. Phase 1 was series of in-depth telephone interviews with a total of 29 authors/editors, librarians and publishers. Phase 2 was a web-based survey in which almost 1400 authors and 155 librarians participated. The feedback obtained has helped determine not only whether UF is a meaningful concept with the potential to provide additional insights into the value and quality of online journals, but also how it might be implemented. The results obtained have also provided useful pointers for the topics to be explored further, if it is decided to take this project further. The apparent eagerness of senior executives to take part in the interviews and the large number of responses to the web survey indicate the high level of interest in journal quality measures in general and the Usage Factor concept in particular.

Based on these results it appears that it would not only be feasible to develop a meaningful journal Usage Factor, but that there is broad support for its implementation. Detailed conclusions and recommendations are provided in Section 4 of this report. Principal among these are:

- the COUNTER usage statistics are not yet seen as a solid enough foundation on which to build a new global measure such as Usage Factor, but confidence in them is growing and they are seen as the only viable basis for UF
- the majority of publishers are supportive of the UF concept, appear to be willing, in principle to participate in the calculation and publication of UFs, and are prepared to see their journals ranked according to UF
- there is a diversity of opinion on the way in which UF should be calculated, in particular on how to define the following terms: 'total usage', 'specified usage period', and 'total number of articles published online'. Tests with real usage data will be required to refine the definitions for these terms.
- there is not a significant difference between authors in different areas of academic research on the validity of journal Impact Factors as a measure of quality
- the great majority of authors in all fields of academic research would welcome a new, usage-based measure of the value of journals
- UF, were it available, would be a highly ranked factor by librarians, not only in the evaluation of journals for potential purchase, but also in the evaluation of journals for retention or cancellation
- publishers are, on the whole, unwilling to provide their usage data to a third party for consolidation and for calculation of UF. The majority appear to be willing to calculate UFs for their own journals and to have this process audited. This is generally perceived as a natural extension of the work already being done for COUNTER. While it may have implications for systems, these are not seen as being problematic.
- COUNTER is on the whole trusted by librarians and publishers and is seen as having a role in the development and maintenance of UFs, possibly in partnership with another industry organization. Any organization filling this role must be trusted by both librarians and publishers and include representatives of publishers and librarians.
- there are several structural problems with online usage data that would have to be addressed for UFs to be credible. Notable among these is the perception that online usage data is much more easily manipulated than is citation data.
- should UKSG wish to take this project further there is a strong likelihood that other agencies would be interested in contributing financial support

## 1. Background

ISI's journal Impact Factors, based on citation data, have become generally accepted as a valid measure of the quality of scholarly journals, and are widely used by publishers, authors, funding agencies and librarians as measures of journal quality. There are, nevertheless, misgivings about an over-reliance on Impact Factor alone in this respect. The availability of the majority of significant scholarly journals online, combined with the availability of increasingly credible COUNTER-compliant online usage statistics, raises the possibility of a parallel usage-based measure of journal performance becoming a viable additional metric. Such a metric, which may be termed 'Usage Factor', could be based on the data contained in COUNTER Journal Report 1 (Number of Successful Full-text Article Requests by Month and Journal) calculated as illustrated in Equation 1 below for an individual journal:

$$(1) \quad \text{Usage Factor} = \frac{\text{Total usage (COUNTER JR1 data for a specified period)}}{\text{Total number of articles published online (during a specified period)}}$$

There is growing interest in the development of usage-based alternatives to citation-based measures of journal performance and this is reflected in the funding being made available for this work. Especially noteworthy in this respect is the work of Bollen and Van de Stempel at Los Alamos National Laboratory. In 2006 they received a grant of over \$800k from the Mellon Foundation to develop a toolkit of quantitative measures of journal performance. They are particularly interested in usage-based measures and in October 2006 published an article entitled "Usage Impact Factor; the effects of sample characteristics on usage-based impact metrics" (1).

It remains to be seen whether any practical, generally applicable tool will result from the Los Alamos work. They are, however, very keen to learn of the results of this UKSG survey and to keep in contact on how this is taken forward. They do not see the two projects as being in competition and think that the two approaches may be mutually beneficial in terms of cross-validation of results.

## 2. Aims & Objectives

The overall objective of this study was to determine whether the Usage Factor (UF) concept is a meaningful one, whether it will be practical to implement and whether it will provide additional insights into the value and quality of online journals. The study was divided into two Phases. In Phase 1 in-depth interviews were held with 29 prominent opinion makers from the STM author/editor, librarian and journal publisher communities, not only to explore their reaction to the Usage Factor in principle, but also to discuss how it might be implemented and used. Phase 2 consisted of a web-based survey of a larger cross-section of the author and librarian communities

Phase 1 addressed the following areas:

- a. The reaction, in principle, of authors, librarians, publishers and other relevant stakeholders, to the UF concept. How UF would sit alongside existing measures of quality and value such as IF. Possible benefits and drawbacks were explored.
- b. The practical implications for publishers of the implementation of UF, including IT and systems issues.
- c. The time window during which usage should be measured to derive the Usage Factor, including the years/volumes for which usage should be measured.
- d. The most practical way of consolidating the relevant usage statistics (the numerator in Equation 1 above), whether direct from the publishers or from libraries (or some combination), and the sample size and characteristics required for a meaningful result.

- e. The most practical way of gathering the relevant data on the number of articles published in the online journals (the denominator in Equation 1 above), including the relevant period of publication.
- f. The level of precision required in the data to make the Usage Factor a meaningful measure.
- g. The implications of excluding non-COUNTER compliant publishers/journals.

Phase 2, using a much larger sample, was designed to:

- a. Discover what librarians think about the measures that are currently used to evaluate scholarly journal in relation to purchase, retention or cancellation
- b. Discover librarians' views on the potential value of UF
- c. Discover what academic authors think about the measures that are currently used to assess the value of scholarly journals (notably Impact Factor).
- d. Gauge the potential for usage-based measures

### 3. Results and Discussion

#### a. Phase 1: in-depth interviews (Conducted by Peter Shepherd)

The 29 interviews conducted fell into the following categories:

Authors: 7  
 Librarians: 9  
 Publishers: 13

A larger number of publishers than originally expected accepted the invitation to be interviewed; indeed, some vendor organizations, once they heard of the project, proposed themselves for interview.

In this section the results of all the interviews are summarised and discussed under each question below. (Note: there were some differences in the questions used for authors, librarians and publishers and not all questions were posed to all categories. This is indicated as appropriate for each question.)

1. How would you rank the following factors in order of importance when you consider journals; for publication of your research (authors); for potential purchase, retention or cancellation (librarians); compared with competing journals (publishers)?
  - a. Journal title
  - b. Editor
  - c. Standard of service (speed of publication, efficiency of refereeing, etc.)
  - d. Feedback from academic staff
  - e. Impact Factor (IF)
  - f. Readership
  - g. Visibility
  - h. Usage
  - i. Price

Authors: there was quite a spread of results here, with no single factor being dominant. Although the sample size was small, there is an indication that IFs are ranked more highly by biomedical researchers than by researchers in other fields; 3 authors considered IF to be the most important criterion; the second most important criterion was audience/readership. The standard of service provided by the journal was the least mentioned. Other factors cited included 'publication of similar studies in the journal' and whether the publisher has a programme in the field. Usage is not yet a factor considered by these authors.

As two of the authors interviewed are experts in the field of scholarly communication (Nicholas and Tenopir) their comments are of particular interest. David Nicholas pointed out that he ranks IF highly, not because it is a rigorous measure, but because it is used by funding agencies as the main measure of the quality of published research, which forces authors to publish in high IF journals, even if they might not be the most appropriate outlet for a particular article. Other authors who ranked IF highly also indicated that this is the case. Carol Tenopir is a leading researcher into the behaviour of STM authors. In her experience, authors select journals that will give their articles prestige and reach. IF is a widely used surrogate for the former, while perceived circulation and readership reflect the latter. She thinks that usage is becoming more important as a measure of reach, but this has not yet percolated down to authors in general.

Librarians: Several librarians differentiated between the decision to acquire a new journal and the decision to retain/cancel a journal already in the collection. In the former case input from academic staff is by far the most important factor, while in the latter case usage and price are important factors. IF is assumed to be an important factor in the eyes of the academic staff, who tend to wish to acquire and retain high IF journals. The reputation of the publisher is a consideration, but secondary one.

The majority of librarians mentioned that the growing dominance of publisher Big Deals makes it more difficult to make acquisition/cancellation decisions at the individual journal level, as there is limited flexibility to change the titles within the package. This has led to a growing tension with academic staff, who are interested in small subsets of the journals in a typical Big Deal. In institutions where journal budgets are held at the department level, such tensions are particularly strong, as the Big Deals are negotiated at the institute level, which can result in the budget holders not being able to purchase the precise collection they want.

Publishers: by far the most important factor used by publishers for the benchmarking of their journals is, despite its acknowledged flaws, IF (along with other citation-based measures), followed by the standard of service to authors (for three publishers this was the most important factor). The other factors are much less important overall. For 6 of the publishers usage is the second or third most important factor, and it is acknowledged by several that usage will become a much more important measure in the coming years.

High Wire Press is included in this category, although they are not strictly a publisher. They feel that UF will be welcomed especially by non-Society publishers, whose journals may rank higher than by IF. They also feel that the larger publishers will have an inbuilt advantage when usage-based measures are applied, as they have quantities of content on their sites, which tends to attract lots of users, which will amplify the usage of all the content on that site.

2. What are the advantages and disadvantages of Impact Factor as a measure of the value, popularity and status of a journal?

All three groups surveyed had a good appreciation of the advantages and disadvantages of IFs and raised broadly similar issues:

Advantages of IFs

- well-established
- widely recognised, accepted and understood
- difficult to defraud
- endorsed by funding agencies and scientists
- simple and accessible quantitative measure
- independent
- global
- journals covered are measured on the same basis
- comparable data available over a period of decades

- broadly reflect the relative scientific quality of journals in a given field
- its faults are generally known

Disadvantages of IFs:

- bias towards US journals; non-English language journals poorly covered
- optimized for biomedical sciences, work less well in other fields
- can be manipulated by, eg, self-citation
- over-used, mis-used and over-interpreted
- is an average for a journal; provides no insight into individual articles
- formula is flawed; two year time window too short for most fields
- can only be used for comparing journals within a field
- only a true reflection of the value of a journal in pure research fields
- under-rates high-quality niche journals
- does not cover all fields of scholarship
- over-emphasis on IF distorts the behaviour of authors and publishers
- time-lag before IFs are calculated and reported; new journals have no IF
- emphasis on IF masks the great richness of citation data
- reflect only 'author' use of journals, not other groups, such as students
- publishers over-emphasise IFs in their marketing
- IF has a monopoly of comparable, quantitative journal measures
- reinforces the position of existing, dominant journals
- ISI categories are not appropriate and neglect smaller, significant fields

3. How well do you feel served by non-citation measures of journal value and performance?

- a. Are you familiar with the research of Bollen et al at Los Alamos National Laboratory, who are developing a toolkit of alternative, non-citation measures of the impact of journals and individual articles?

The essence of the responses to this question was that there are few, if any, such measures that are universal and comparable, which is one reason for the over-reliance on citation data. The development of alternative, usage based measures would be very helpful. One currently available metric that is useful, at least from the perspective of some publishers, is the total number of articles published, which is also provided by ISI. This is used as a measure of market share (by journal and by publisher) and the trend over a period of can be monitored. Specific comments included:

- the number of papers published in a journal is useful – volume matters
- a modified IF, which measures citations over a longer period, would be valuable
- citation-based measures do not reflect the true value of journals. Student usage of online journals, which is 5-10-fold higher than faculty usage, according to a recent CIBER study, is hardly taken into account in IFs.
- the only practical alternative is usage
- suspicious of a too-heavy reliance on quantitative measures; qualitative measures are just as valuable
- usage-based measures would be very valuable indeed
- there is a dearth of non-citation based comparative measures
- If the purpose is to provide tools to aid librarians in making decisions on their collections, then some simple, additional measures such as UF would be valuable. If the purpose is to understand user behaviour, then more sophisticated measures, such as those being developed at Los Alamos, are needed.
- usage data has potential, but is not yet reliable enough
- the COUNTER usage statistics offer the best prospect for a body of reliable, comparable data. To be credible quantitative measures must have a close and understandable relationship to data. Metrics that are composites of many factors are not helpful
- usage data is more immediate than citation data

Only a minority of the respondents were familiar with the work of the Los Alamos group. Of those who were, the view is that while their work will provide some useful new insights into usage it is very sophisticated, takes into consideration many factors and is unlikely to lead to the development of a really practical new tool that can be applied routinely.

4. Are you confident that COUNTER-compliant usage statistics are a reliable basis for assessing the value, popularity and status of a journal? Do you, or do you plan to, use usage data (or metrics derived from usage data, such as cost per use) to support your acquisition/retention/cancellation of online journals? (Librarians only)

Of the 9 librarian respondents, 5 are confident that the COUNTER usage statistics are a reliable basis for assessing the value, popularity and status of a journal. The remaining 4 thought that they are not sufficiently reliable yet, but that COUNTER is going in the right direction. Comments included:

- COUNTER is getting there
- COUNTER is fine as far as it goes
- COUNTER data needs to be made more robust; there are still differences between publisher applications and mistakes continue to be made

5. Are you interested in how frequently your articles are used online? (Authors only)

6 of the 7 authors are interested in knowing how frequently their articles are accessed online. One author currently monitors the Web of Science to access how frequently his articles are being cited; he would find the usage equivalent of this very valuable. Other authors mentioned that they are also very interested in where and by whom their articles are being used. The majority of the authors were not familiar with COUNTER.

6. Are Google Page Rankings of your articles important to you? (Authors and publishers only)

Authors: 4 of the 7 authors responded 'yes' to this question; 3 responded 'no'. Of those who said 'no', one acknowledged that Google rankings are of increasing importance, as journal articles are increasingly accessed via search engines rather than via the journal home page. Another author questioned the credibility of Google rankings, as they are too easy to manipulate and are subject to click fraud.

Publishers: 11 of the 13 publishers responded 'yes' to this question. The major factor in this positive response appears to be the fact that a growing percentage of online journal usage is via links from Google (as well as Google Scholar and other search engines), which is a motivation for publishers to optimize the design of their websites to maximise Google rankings. For some publishers as much as 50% of their online journal usage comes via links from Google and Google Scholar.

7. Would Journal Usage Factors be helpful to you in assessing the value, status and relevance of a journal?

All 7 authors answered 'yes' to this question, although one author said that it would depend on how UF is calculated. All 9 librarians also answered 'yes' and several expanded on their answer with the following comments:

- the Dean of Research is very frustrated by the lack of quantitative, comparative information on the majority of the journals Yale takes. Only around 8000 of their 30000 titles are covered by IFs. Usage reflects the value of a journal to the wider community than citations

- Yes, if appropriately defined and based on reliable, concrete data. UFs would be a counterweights to IFs and would make the scientists a bit more sceptical about IFs, which would be good.
- they would certainly find UF an excellent way to highlight journals in the collection that are 'undervalued' by IF.

The response from publishers was less unanimous, with 8 responding 'yes', 2 responding 'no' and 3 with mixed feelings. The specific comments made by the publishers included:

- COUNTER is seen as independent, so metrics derived from COUNTER data would have significant value. It would also be useful to have a UF per article, as the funding bodies and authors would be interested in this. Another way to look at it is to measure total usage, usage of current articles and usage of articles in the archive
- UFs will be a useful alternative measure to IFs, but we should be under no illusions, they will have the same weaknesses as IFs.
- UFs could be useful, but this depends how the calculation is performed. What new insights would UFs provide? They have found that in a pilot project in which they calculated UFs for a range of their journals they found that the rankings were the same as for IF.
- COUNTER records only online usage. How would print usage, still significant for many journals, be taken into account?
- usage should cover more than full text articles alone, as supplementary features, video clips, etc. are becoming more important components of online journals
- the proposed method for calculating UFs is not statistically robust, as it does not take into account the number of users for a particular journal.
- Would another global measure, such as usage half-life per journal or per discipline, not be of greater value?

8. The way we propose to calculate a journal's Usage Factor is described in Equation 1 above. We are interested in your comments on the following definitions:

- a. *'Total Usage' (from COUNTER Journal Report 1): would this be most useful as a global figure, a national figure or a per-institution figure?*

All 7 authors would find a global figure useful- research is a global enterprise- but only a minority would be interested in more local UFs. Only two authors had comments on the methodology for consolidating the global usage data:

- On balance it would make sense for publishers to consolidate the data rather than librarians.
- Publishers are better placed than libraries to consolidate this data.

All 9 librarians would also find a global journal UF useful, but 7 would like to have UFs at the institute/consortium level, while only 5 think that a national UF would be of value. The majority of the librarians stated that only the COUNTER usage statistics should be used, as this is the best guarantee of comparability; it is acknowledged that not all vendors are yet COUNTER compliant, but the number is growing. In an increasingly 'distributed' online article publishing system in which usage of articles occurs on a number of sites, as much of this usage as is practically possible should be included in the UF calculation for a particular journal. 100% coverage will probably be impossible, but this need not undermine the credibility of the usage statistics. Individual comments included:

- A global figure would make most sense. perhaps the other levels could be added later, as and when required
- A global figure and an institutional figure would be useful. A national figure might be used by politicians
- All would be useful, for different reasons.....National UFs would be useful for comparison with institutional UFs, not only for library management, but also for benchmarking the institution's performance in, for example the research

assessment exercise. Are an institution's authors publishing in high UF journals?

- Only the COUNTER usage statistics should be included, as this is the only guarantee of comparability. All usage for a particular journal should be included, from whatever source.
- It will probably not be practical to obtain a truly global figure, given the increasing use of articles via institutional repositories, etc. A consolidating organization would have to be provided with very clear guidelines about the usage statistics to include. Only COUNTER compliant usage should be included in the calculation.
- It would be difficult for librarians to consolidate global usage statistics. Could not publishers do this?

While all 13 publishers favour global UFs, they are much more sceptical about the value of national and local UFs. A significant motivation for this scepticism is the amount of effort on the publisher's part involved in generating the national and local UFs, which they would not be prepared to expend until they were convinced of the benefits. Specific comments made by publishers include:

- usage data is more susceptible to bias and manipulation than citation data
- the costs involved in calculating lower-level figures and question their value. As publishers will end up paying for this they should have some control over the process
- Institutes would find data such as cost-per-use more helpful
- Too many levels would become confusing. National and local UFs could be calculated as and when required for particular studies
- In the longer term the definition of usage as being only full text articles will be too narrow....Other features will become more critical and their use should be measured as that is where the value of the site will lie.
- The number of users should be taken into account
- To evaluate a title in total you will need to integrate the information from all hosting sites. (In addition to the publisher site this could include aggregators, PubMed Central, etc.)
- Publishers are interested in obtaining total global usage figures for their journals, and have a motivation to consolidate such data; it will probably not be possible to get a figure for 100% usage, but this need not weaken the UF concept.
- It would make more sense for the publishers to consolidate the global usage data for their own journals, rather than leave this to a third party. Could the validity of the publisher results be checked periodically by another approach?
- The publishers will want to consolidate their own global usage statistics and would be more comfortable doing this themselves rather than providing usage data to a third party.

b. *'Specified usage period' (numerator): we propose that this should be one calendar year. Do you agree with this?*

There was overwhelming agreement that the specified usage period be one calendar year. Some librarians thought that an academic year or fiscal year figure would fit better with their decision-making process, but this was very much a minority view. One publisher suggested that we consider doing the UF calculation the other way round, i.e. we measure usage over a two year period, for one-year's worth of articles. The two year period would cover the year of publication and the next year; this would take into account not only the usage peak upon publication, but the second peak that occurs when articles begin to be cited and are seen as 'significant'. A second measure could be: 'total article downloads in one year/total articles available'. This would give a longer term perspective.

c. *'Total number of articles published online': we propose that this should be all articles for a given journal that are published during a specified period. Which of the following periods would you prefer us to specify:*

- i. previous 2 years
- ii. previous 5 years
- iii. other (please indicate)

*Would it also be worthwhile to consider some sort of measure of "continuing value" to indicate those journals whose articles on average continue to be used significantly for longer periods? (This could measure usage over a period which excluded the current year)*

There was a diversity of responses to this question, with no clear consensus on any time period among authors, librarians or publishers. Even those who selected a specific time period tended to do so with some qualifications. The 'previous 2 years' was the favoured option of 2 authors, 2 librarians and 4 publishers; the 'previous 5 years' was favoured by 2 authors, 1 librarian and 2 publishers; the remainder were unable to select a particular time period, feeling that they had insufficient data on which to base such a selection. Several felt that multiple UFs, based on 2, 5 and even 10 year's worth of articles would be the best approach, as each of these UFs would reveal different things about the journal. The 2-year UF would be a measure of the immediate value of a journal, while the 10-year UF would be a measure of continuing value. Specific comments included:

- Go for the longer period and consider 2, 5 and 10 year UFs, as each would say something different about the journal.
- Both 2 and 5 year periods would be of value, as they would provide different perspectives on the usage of an article. Truly classic articles, for example, may not be highlighted by the short, 2-year window. A 'usage half life' would also be useful as an indicator of an article's staying power. If he had to choose he would find the 5 year period more valuable.
- Can see arguments for both a short time period and a longer time period. A short time period would be more immediate. On the other hand, fluctuations between years is greater for usage than it is for citations and a longer time period would mitigate that volatility. (PS comment: this volatility may be at an individual institute level rather than at a global level). He thinks that tests would have to be run to determine the optimal average period to select. Patterns will vary between disciplines.
- Although measuring usage does not have the same lag as citation data, the time period should not be too short. The minimum should be 2 years. Somewhere in the 2-5 year period would be best, but this should be tested. Two UFs, one shorter, one longer, could give valuable insights, as in some fields usage peaks early, while in others it takes longer to build.
- Go for the shorter period, as it would give UF more immediacy than IF. A period as short as one year would be even better.
- Go for a longer period, but suggests that two periods are taken, as each would tell different things about usage. A two-year and a ten-year UF would make sense, but the actual times periods should be tested.
- A usage half-life per journal would also be valuable, as this will vary considerable between disciplines
- Tests should be done to determine the most appropriate time window, as usage patterns over time vary between fields
- Go for 2 years. UF should be more immediate than IF. Given the trend towards free availability of research articles after a period, paid access is going to be increasingly regarded as being for a shorter period after publication. Librarians will want metrics to cover the period for which they are paying. Five years would be too long.
- Definitely the 5-year period. In most fields usage is slow to build and to decline. Studies have shown that even after 10 years only 80% of usage typically takes place. Even in life sciences, where 60% of usage can be within the first 12 months of publication, only 90% of total usage has occurred after 10 years.
- The time window should be short; he would prefer 1 year. One of the drawbacks of IFs is the time it takes for the data to be collected and processed. This is a handicap that IFs cannot overcome. Usage data is more immediate and UFs should take

advantage of this. As well as providing calculated global UFs the underlying data should be provided at the individual article level to allow more sophisticated and detailed analyses to be done.

- Too early to say what time window is most appropriate. For citation data 2 years is too short, but indications are that for usage data the shorter period may be more appropriate. Tests will be required before this time window could be set. As with IF there are likely to be variations between fields in terms of usage over time.
- They are not able to select a particular period, as they find that the pattern of usage varies so much from journal to journal. In some cases usage of the backfile is heavy, while in other cases it is not. They suggest providing figures for three different periods: 2, 5 and 10 years.
- We would also like a UF calculated for content published in the last 12 months, on a rolling basis. This would give something similar to ISI's Immediacy Index. *Total* usage, i.e. "successful" full text downloads needs to be related to total number of articles available – perhaps both at the beginning and the end of the time period in which usage is to be counted.
- To begin with it would make sense to use the ISI data for 'source items'. This is not perfect, but it is the same for all publishers and is an easy figure to check. Expanding this definition would require a lot of debate, which may not be productive at this stage, as there are other factors to be agreed.
- Ideally the total number of articles should be wider than the ISI definition, but the latter would make a sensible starting point.
- ISI source item data is available, but not for all journals. How would the data on the numbers of articles published in journals not covered by ISI be obtained?

9. How could Usage Factor be made meaningful and useful to you? (Authors only)

The responses to this question fell into two broad categories: those who had specific comments on what should be included in the calculation and those whose message was 'keep it simple'. Comments included.

- the UF article count should include every item published in the journal. Restricting the type of item covered to the same as ISI would distort the usage picture
- The citation-based Hirsch Index, which can be calculated for individual scientists using freely available web-based programmes, is an increasingly used alternative to IFs, which are journal-based rather than individual-based. The Hirsch Index is more appropriate for use by funding agencies, etc. A usage-based equivalent of the Hirsch index would be extremely valuable indeed. Each scientist could have his own index, irrespective of whether the journals he publishes in are covered by ISI. It would be a better measure of true value than citations.
- UF should be kept simple and used in combination with other quantitative metrics, as well as qualitative information from surveys, case studies, etc. Only a global UF should be calculated, at least initially.

10. Would you feel comfortable having journals ranked by usage as well as by citations? (Authors and publishers only)

Authors: all 7 authors responded 'yes' to this question. Individual comments included:

- Having another metric would help correct the distortions caused the heavy current reliance on IFs
- Many of the publications in which she publishes and in which she would like to publish do not have IFs and the current system almost requires serious authors to publish in journals that have IFs.

Publishers: the response was more mixed, with 8 publishers saying 'yes' (several said 'yes, but..') and 5 saying 'no' (several said 'not unless...') Individual comments included:

- Not in the short term. Usage patterns are still too 'wild' and vary widely between hard science and the social sciences. They would want to wait until these have settled down.
- This is going to happen in any event, so it is best that UF is developed and implemented by a trusted organization in which publishers are represented.
- This would be a useful thing to do, provided publishers were confident with the basis for the calculation; trials would be required to provide such confidence. Some scientific disciplines are motivated by downloads (materials science), while others are motivated by citations (life sciences). This affects their publishing choices and the current citation only based system is appropriate to some groups of scientists, but not to others.
- In principle, yes, but he would want to see how things pan out in a trial before committing to this.
- Yes, if the COUNTER data were made more robust.....We should not create another flawed measure.
- Not until they can easily consolidate the usage of their journals from all the important sources: Springer Link, OhioLink, Ingenta, etc. They would not want to risk undercounting usage and depressing their UF! Their contracts with Ingenta etc require them to provide usage statistics, but they do not yet enforce this rigorously.
- No. Their journals do well in the IF rankings and they would fear that introducing usage into the picture would adversely affect their journal rankings. They feel that ranking by usage would tend to favour lower quality journals; they feel that they are at the high end of the market. They have 'invested a lot' in IFs as a measure of quality.

11. Which organizations could fill a useful role in compiling Usage Factor data, benchmarking and commentary? (In the UK possible candidate organizations include JISC or SCONUL). Publishers: would you be prepared to provide your COUNTER Journal Report 1 usage data to an aggregating central organization for the calculation of global, national or regional Usage Factors? (Librarians and Publishers only)

There was a wide diversity of responses to this question and there is no existing organization with sufficient credibility and capability in the eyes of both publishers and librarians to fulfil this role. Several suggested that the mission of COUNTER could be expanded to fill such a role, possibly in partnership with another organization with complementary capabilities. Organizations that came up in these discussions were:

- COUNTER: while it is acknowledged that COUNTER does not currently have the capabilities to fill this role, it does have high credibility and was mentioned both by librarians and publishers
- CrossRef: acceptable to publishers, but does not currently have the required capabilities
- OCLC: has a lot of experience compiling large volumes of usage data
- ARL: proposed by ARL, who work closely with CARL and SCONUL. Publishers who mentioned ARL made it clear that they feel it is insufficiently independent
- JISC: mentioned by UK librarians, but not acceptable to some publishers
- SCONUL: does not have the resources and not acceptable to some publishers
- UKSG: represents both librarians and vendors
- RIN: mainly a discussion forum

One librarian was against having a large role for any central organization, as it is likely to be a considerable additional cost to the industry. She felt that the role of such an organization should be restricted to compiling the UFs, which had already been calculated by the publishers and independently audited. This would minimise the cost.

The majority of publishers are willing, in principle, to do this, with the right partner. Key issues are 'trust', 'independence' and 'cost-effectiveness'. Any organization aspiring to fill the consolidation/compilation role would have to meet these criteria to be acceptable to publishers. One or two publishers have yet to be convinced of the value of such an exercise.

12. Would you be prepared, in principle, to calculate and publish global Usage Factors for your journals, according to an agreed international standard? (Publishers only)  
a. Would you be prepared for such a process to be independently audited?

11 publishers responded with a 'yes' to both these questions, although for some it was a qualified 'yes'. Only one publisher said 'no' outright. See comments below:

- Yes, in principle, but they would have to be convinced that the playing field was even for all publishers. There is a danger that the development of UF will further stimulate publishers to inflate their usage by every means.
- In principle they do not rule this out, but would have to be convinced of the value of such an exercise, as it would involve a lot of work on their part. They have concerns about the basis of the proposed UF calculation, but if there was strong demand from the library/author communities for such a metric they would probably be prepared to take part.
- In principle, yes, but remain to be convinced that it would be a meaningful measure. Elsevier, for example, has a huge sales force devoted to selling online licenses and increasing usage of their journals. The societies do not have such resources and they feel that IF is a more level playing field on which to judge journal quality.
- Yes, in principle, but their attitude would be customer driven and they are unlikely to be in the vanguard of adopters

Publishers understand that there are organizational and systems implications for them if UF becomes an accepted measure, especially if they themselves are required to consolidate usage data from various sources for their journals and calculate UFs. While this would involve additional systems resources most feel that these are not qualitatively different from what is already required for COUNTER and most publishers would prefer to do this themselves rather than send their usage data to a third party. Some publishers already consolidate their usage data from several sources and also maintain figures on the total number of articles published in each of their journals.

13. What benefits do you think there would be to publishers of participating in the calculation of Usage Factors? Would you find it useful, for example, to have your journals benchmarked against a basket of other journals in the same field? Would Usage factor help you demonstrate to libraries the value of the package they are purchasing? Cost per download can already be calculated; would Usage Factor add provide helpful additional insights? (Publishers only)

Comments received included:

- AIP is very reluctant to incur extra costs unless there is a real benefit to them or to the field. They feel, however that a UF need not be too costly to implement if the publishers calculated it and their process is audited, which is required for COUNTER in any event.
- Usage data will be used as a measure of value, whether publishers like it or not. This being the case it is better for metrics such as UF to be developed and managed by organizations that publishers control.
- By participating in this process, publishers will influence it, helping to develop useful measures in which they can have confidence. Currently journal publishers are under a lot of pressure to demonstrate the value they provide. The challenge from open access has further stimulated this.
- The main advantage is that it will provide an alternative, credible, measure of journal value to IFs Two measures with different limitations are better than one, and UF will be clearly divided from a set of credible, understandable data.
- UF would provide them with another measure that could be used for comparison of their journals with others, but they are sceptical as to whether it would provide real new insights. They are, however, open minded and could be convinced. They feel that comprehensive testing and refinement will be required before UF could be implemented. They are sceptical of the value of UF to librarians, whom they think require more local measure of value and performance, such as cost per use.
- There are a lot of components of journal value and IFs reflect only part of that value. UFs would give a fuller picture. Usage statistics are susceptible to inflation by

publisher interfaces, etc, so the calculation of UF would have to be convincing to be credible.

- This would be an additional service for customers. It would also improve the ability of publishers to benchmark their services against others. It should help improve competition between publishers and increase the quality of publications.
- UF would definitely benefit publishers. First, it would be a useful balance for IFs, which are not always accurate reflections of the value of a journal. Second, UF is a simple metric that would make usage more understandable to editors and authors as a measure of value. There is currently much talk of usage and a lot of data, which the non-librarians find confusing.
- UF would balance IF, which would be a good thing. It will have many similar problems to IF, but is based on different data, so would have value. Not too much should be read into UF, just as not too much should not be read into IF. The effort in generating UF should be in balance with the value of the measure. It would not be technically difficult to provide basic UF data, but doing so at different levels would confuse rather than clarify
- At this stage they do not see major benefits to publishers, other than keeping customers happy, if they want to have UFs. They are very happy to co-operate in the development of meaningful usage-based measures of journal value, etc., but feel that measures such as 'cost-per use' and measures at an institute level are more useful than a global UF per journal.
- Having a measure other than IF that is publisher-based would be positive for publishers and would also provide a more balanced view of journal quality and value. There is currently too much emphasis on IFs, for example in the UK research assessment exercise. Another credible measure would open up the discussion.

14. Are there any other comments that you would like to make?

- The problem with quantitative measures is that only one is currently being used –IF.
- ISI should be made to fix the problems that IFs currently have and take a longer time period for the cited articles included in the measure. A 10-year time period would not be excessive
- Publishers could be trusted to provide the UFs, provided they were independently audited. He does not see the need for a centralized bureaucracy
- Keep it simple
- This is a great initiative. Usage data is not perfect, but neither is citation data and the two measures, IF and UF, would be complimentary
- A usage-based alternative to IF would be very useful
- Any central organization for collating and managing UF data should be managed by the publishers
- If it is decided to take this project further, it would be worth talking to the PRC (Publishing Research Consortium), which is a joint committee of the PA/STM/ALPSP, chaired by Bob Campbell. They could possibly provide funding and support for trials. It might also be worth talking to Michael Judd at the Research Information Network, as they have research funds and this would fall within their scope. This approach would be well worth taking forward, although trials would be needed before publishers would buy into UF.
- COUNTER does not yet have sufficiently wide coverage to claim that it provides global usage figures
- Although access to full text articles is increasingly via search engines and journals are being purchased as collections rather than as individual publications, they feel that the journal will have an enduring value as a brand and as a quality 'kite mark'. For this reason a journal based UF will be useful.
- Journal UFs would be a good starting point, but the system should be run for a trial period before data is made public. Also, usage should be measured and reported at the individual article level and at the collection level. The journal as a package of articles is becoming less important in an online environment with many user access routes.

- They suggest taking the UF forward in two phases. Phase 1 would provide only a global UF for a short, 2-year time window, calculated by publishers and independently audited. Once this is up and running the time window could be extended and the national, institutional, etc, UFs explored.
- They want to reiterate that if the principles underlying the UF calculation were sound and there was a customer demand for it, they would be willing, in principle to participate. They suggest that pilots will be necessary to refine and test the methodology before they could give a more concrete commitment. They do not have a problem with their comments being made public.
- Before developing the proposed “usage factor”, publishers and COUNTER should first be convinced that authors, librarians, funding bodies and academic tenure committees would use such a metric.

## **b. Phase 2: web-based survey (Conducted by Key Perspectives Ltd)**

### **i. Librarians**

#### **Aim of the survey**

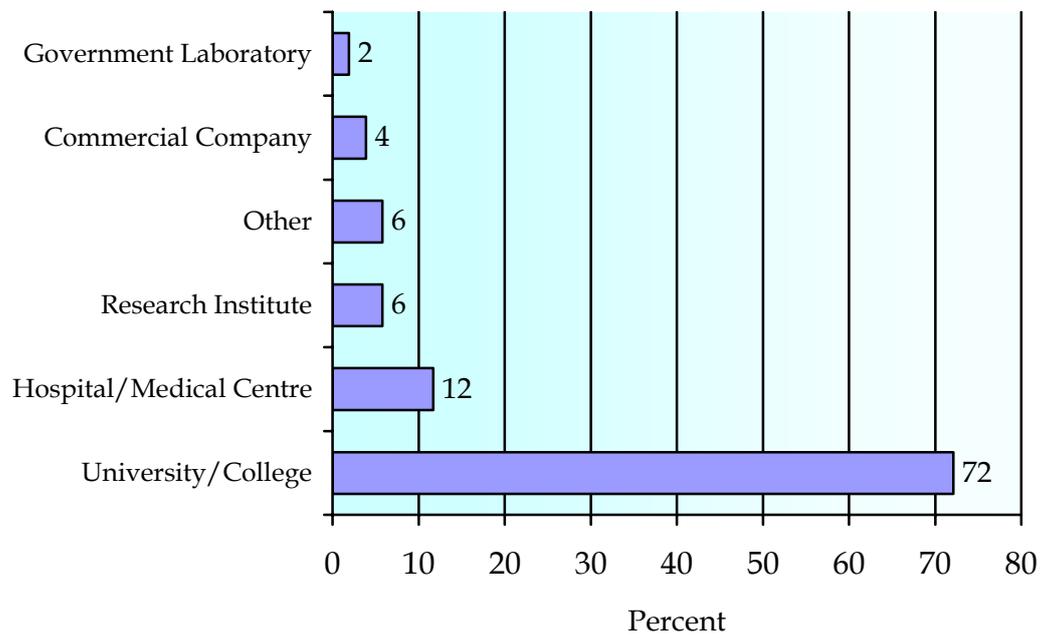
The main aim of this part of the survey was twofold:

- To discover what librarians think about the measures that are currently used to evaluate scholarly journals in relation to purchase, retention or cancellation
- To discover librarians’ views on the potential value of a Usage Factor

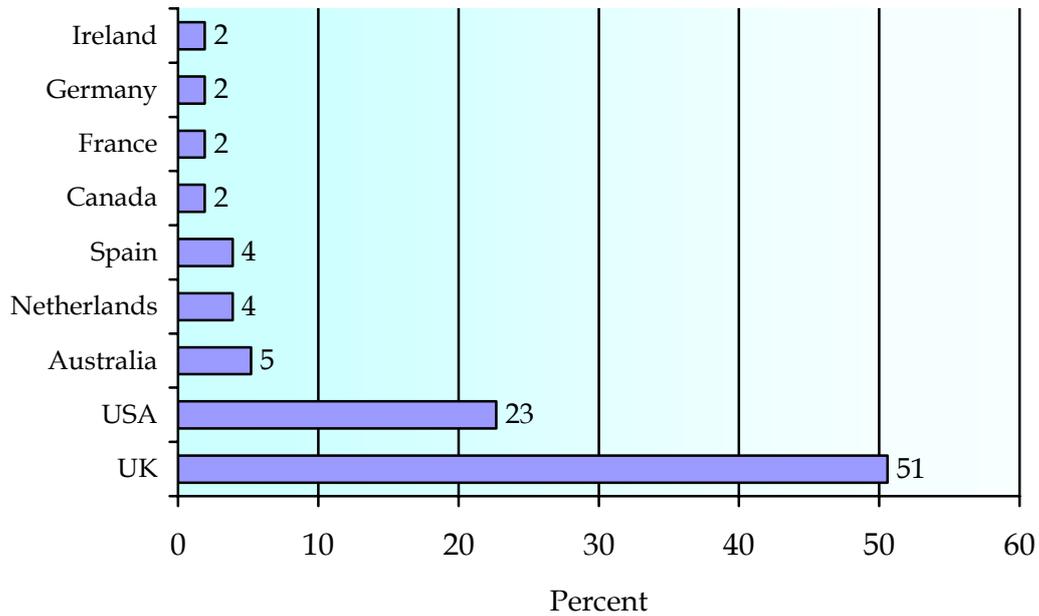
#### **Response to the survey**

Library members of the UKSG used a variety of means to alert librarians to the survey. In total 155 librarians participated. The profile of these librarians is presented in figures 1 to 3.

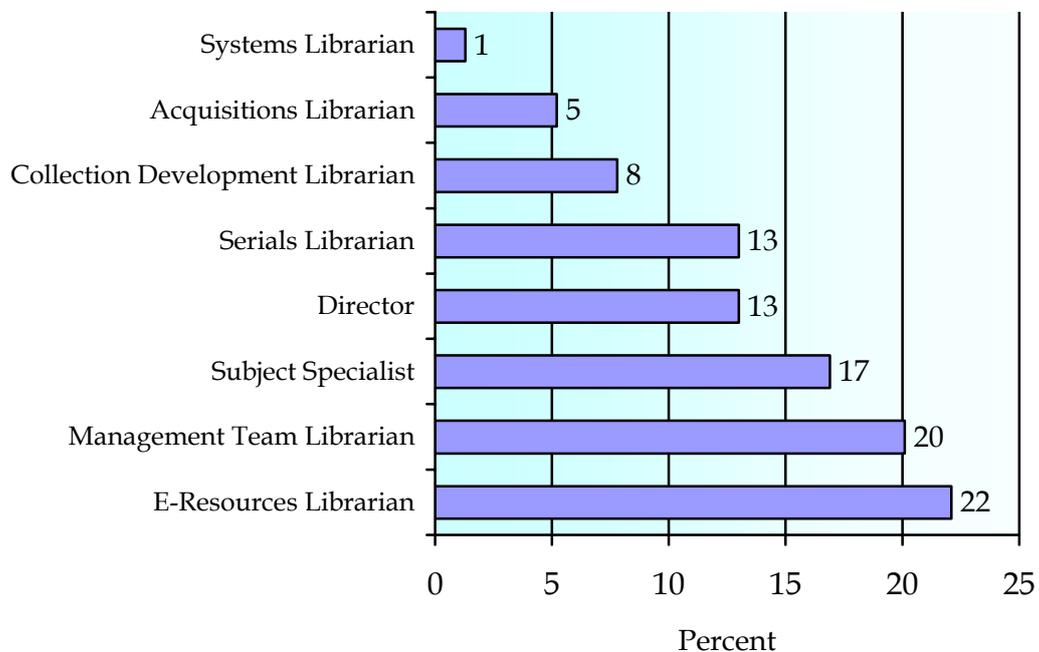
**Figure 1: Proportions of librarians working in different types of organisation**



**Figure 2: Proportions of librarians working in different countries**



**Figure 3: Proportions of librarians working in different roles**



**Librarians' evaluation of the potential value of a Usage Factor**

The librarians' questionnaire was designed so that librarians would first rank, in order of relative importance, a list of key factors known to influence the process of first, evaluating journals for potential purchase and, second, evaluating journals for retention or cancellation.

The questions were presented in matched pairs, so that librarians were asked to rank the known factors first and then, having been introduced to the proposed Usage Factor formula, they were invited to re-rank the list including the Usage Factor.

**The relative importance of key factors related to the potential purchase of journals**

The results, presented in table 1, show that at the moment feedback from library users is the most important consideration in the decision to purchase journals. Next in the list comes price followed by the reputation or status of the publisher and then Impact Factor. When the Usage Factor is introduced to the mix, librarians ranked it second in order of importance. While one might not expect a Usage Factor to supplant user feedback, it is significant that Usage Factor is ranked ahead of price, Impact Factor and the reputation or status of the publisher.

**Table 1: Librarians’ views on the relative importance of key factors in the process of evaluating journals for potential purchase [in rank order]**

| <b>Ranking without Usage Factor</b>      | <b>Ranking with Usage Factor</b>         |
|--|--|
| <b>1. Feedback from library users</b>    | <b>1. Feedback from library users</b>    |
| <b>2. Price</b>                          | <b>2. Usage Factor</b>                   |
| <b>3. Reputation/status of publisher</b> | <b>3. Price</b>                          |
| <b>4. Impact Factor</b>                  | <b>4. Impact Factor</b>                  |
|  | <b>5. Reputation/status of publisher</b> |

**The relative importance of key factors related to the retention or cancellation of journals**

When it comes to evaluating journals for retention or cancellation, librarians are now able to consider usage and cost per download statistics in addition to the factors listed previously. As the results in table 2 indicate, feedback from library users remains the foremost consideration, but it is interesting to note that usage is ranked second in importance ahead of price and cost per download. Impact Factor and the reputation or status of the publisher appear to be relatively unimportant.

When Usage Factor is presented as an option, the re-ranked list in table 2 shows that librarians perceive it to be important, ranking it third behind feedback from library users and usage. Usage Factor is ranked ahead of price and cost per download. It is noteworthy that librarians think a Usage Factor could be more important than Impact Factor.

**Table 2: Librarians' views on the relative importance of key factors in the process of evaluating new journals for retention or cancellation [in rank order]**

| <b>Ranking without Usage Factor</b>      | <b>Ranking with Usage Factor</b>         |
|--|--|
| <b>1. Feedback from library users</b>    | <b>1. Feedback from library users</b>    |
| <b>2. Usage</b>                          | <b>2. Usage</b>                          |
| <b>3. Price</b>                          | <b>3. Usage Factor</b>                   |
| <b>4. Cost per download</b>              | <b>4. Price</b>                          |
| <b>5. Impact Factor</b>                  | <b>5. Cost per download</b>              |
| <b>6. Reputation/status of publisher</b> | <b>6. Impact Factor</b>                  |
|  | <b>7. Reputation/status of publisher</b> |

## ii. Authors

### Aim of the survey

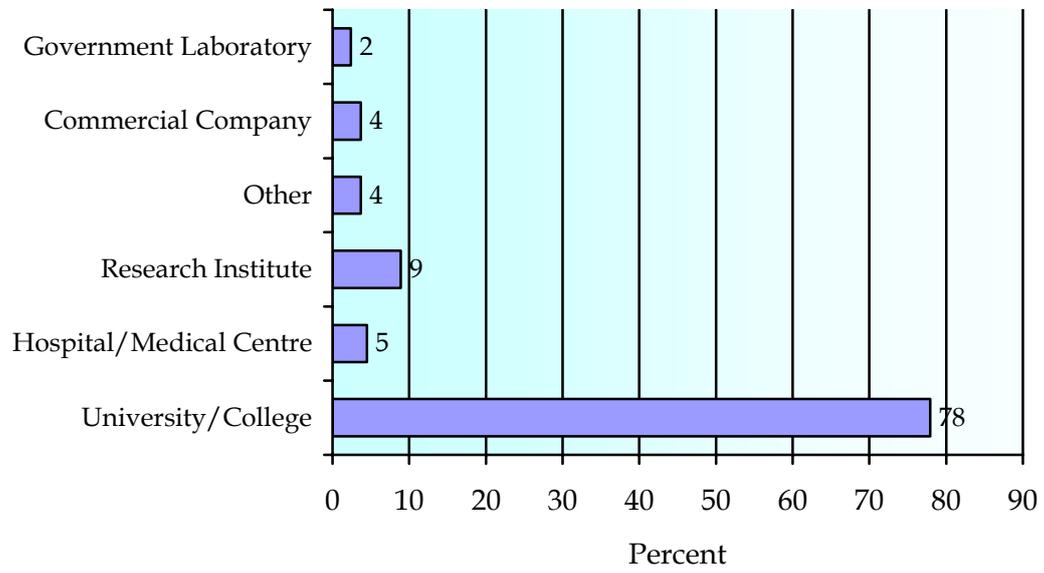
The main aim of this part of the survey was twofold:

- To discover what academic authors think about the measures that are currently used to assess the value of scholarly journals (notably Impact Factors)
- To gauge the potential for usage-based measures

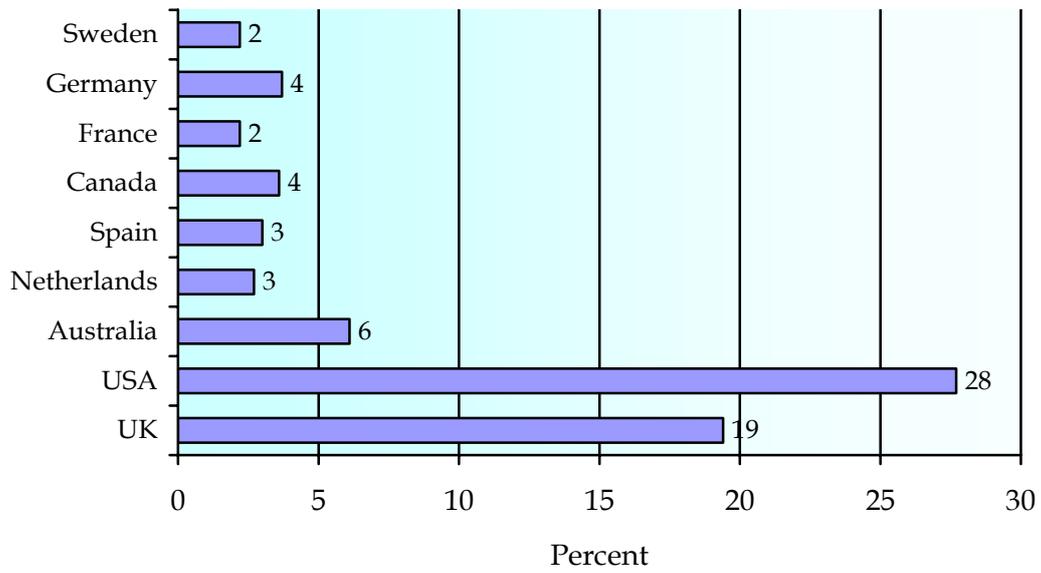
### Response to the survey

A number of leading scholarly publishers who are also members of the UKSG contributed enormously to the project by alerting their authors to the survey. A total of 1394 academic authors participated in the study. The profile of these authors is presented in figures 1 to 4.

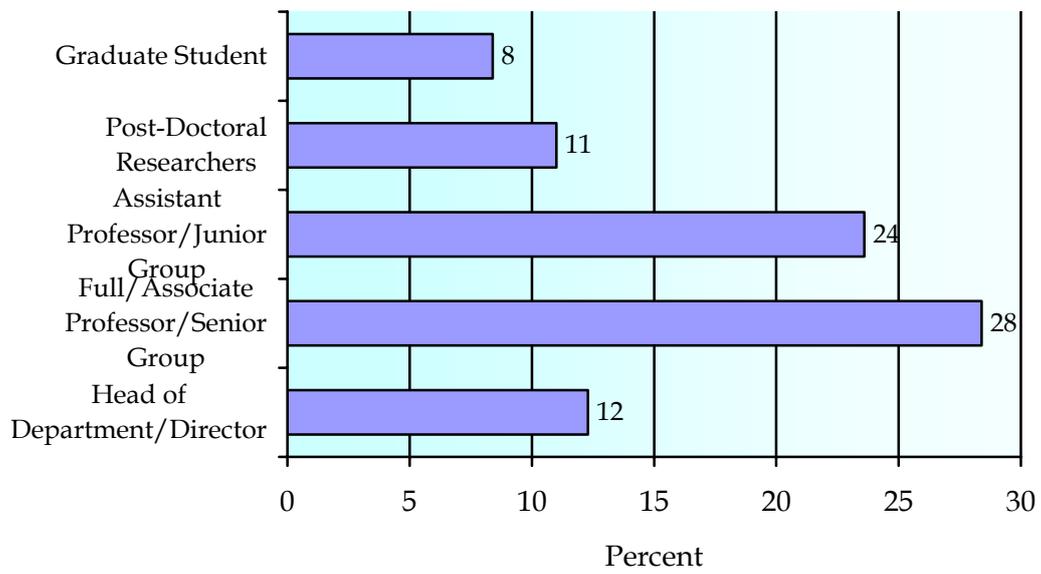
**Figure 1: Proportions of academic authors working in different types of organisation**



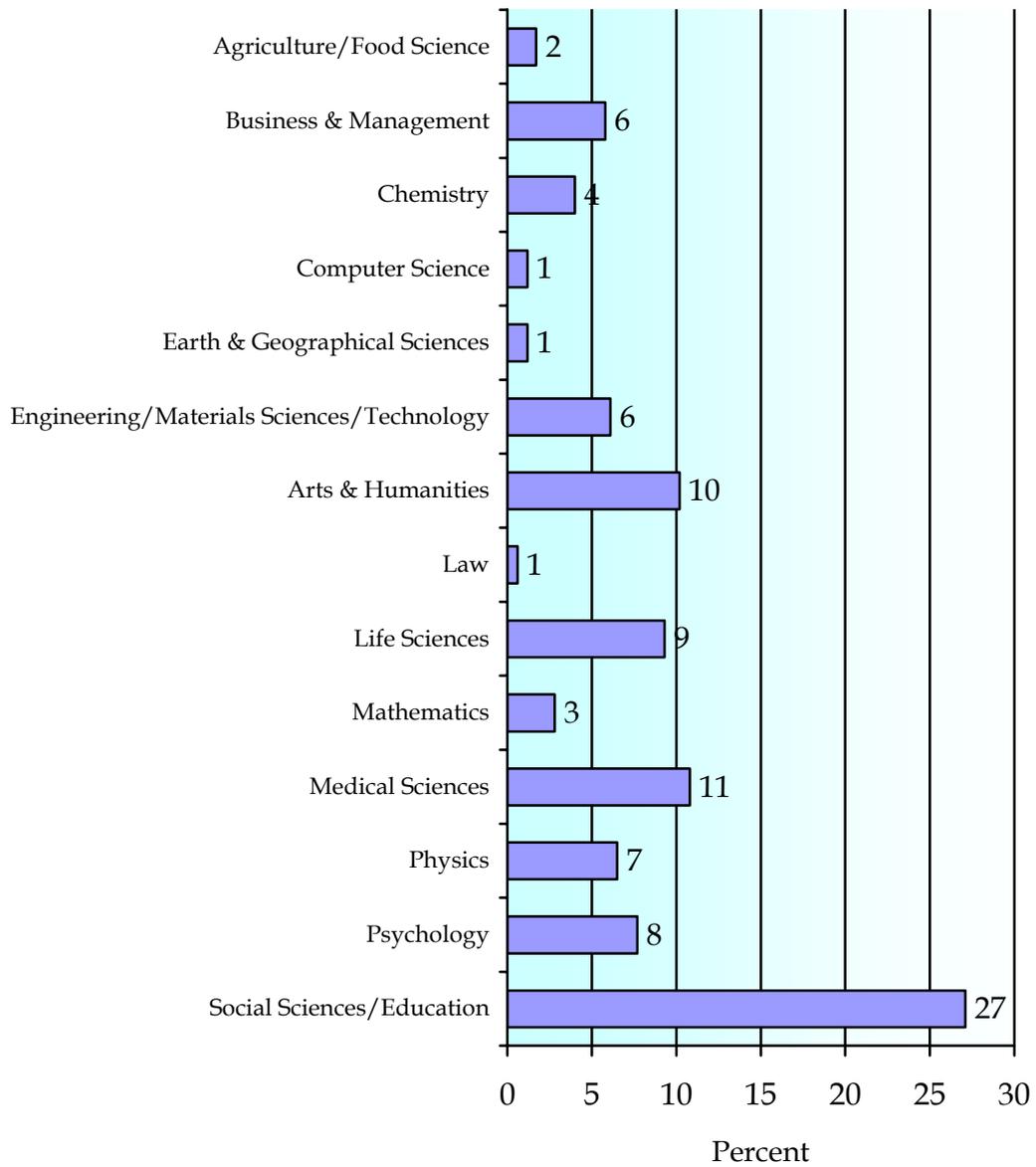
**Figure 2: Proportions of academic authors working in different countries**



**Figure 3: Proportions of academic authors working in different roles**



**Figure 4: Proportions of academic authors working in different subject areas**

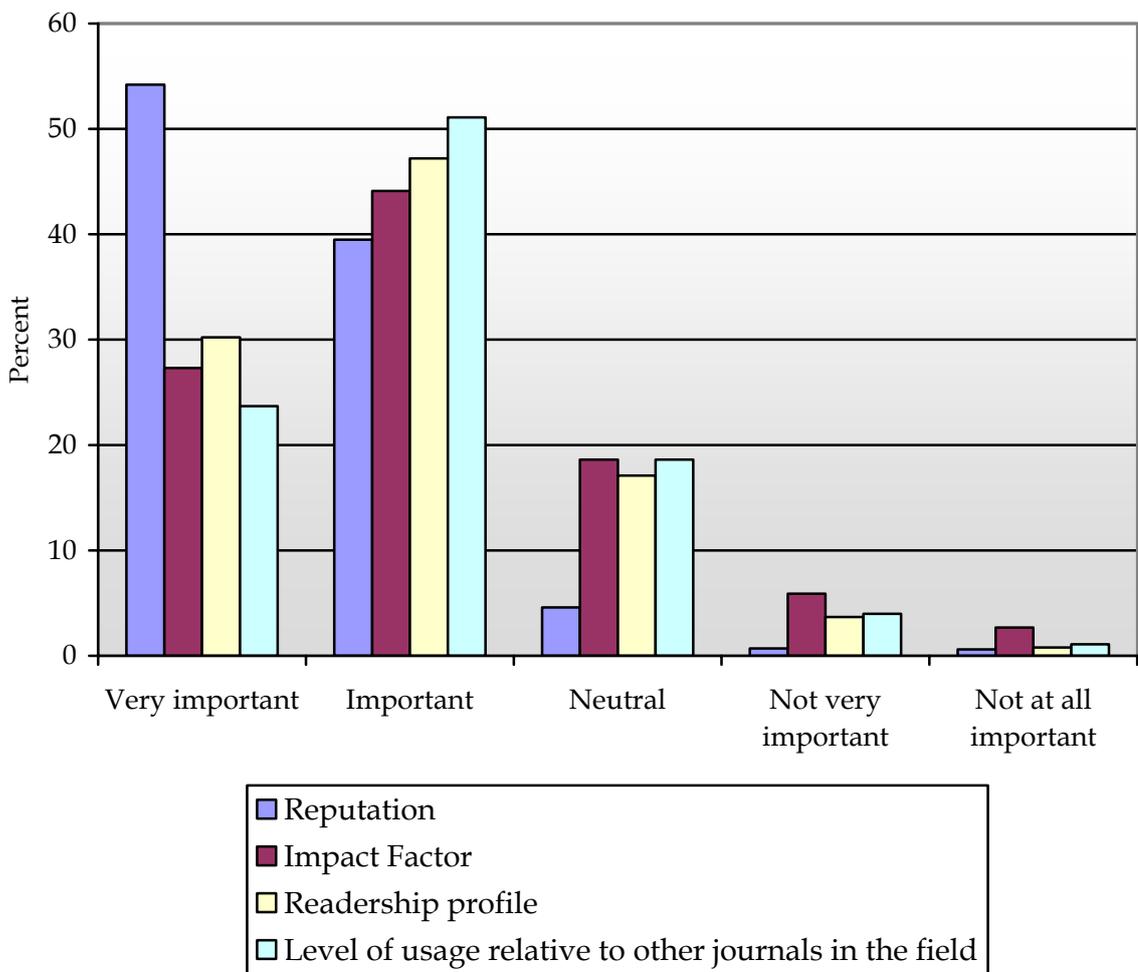


## Journal attributes most important to authors

Academic authors have a number of factors to consider when deciding which journal to submit their work to for publication. The survey set out to understand where Impact Factor fits alongside other factors that are known to be important to authors.

The results, presented in figure 5, show that a journal's **reputation** is *the* most important factor in authors' decision-making process. Authors want their work to be read by their peers so it is not surprising that a journal's **readership profile** ranks second overall in terms of relative importance. Clearly a journal's **Impact Factor** plays an important role in the majority of authors' deliberations about where to publish, but it appears to be a supporting rather than a lead role. The results indicate that authors discern a clear distinction between a journal's reputation and its Impact Factor. Finally, a journal's **level of usage** relative to other journals in the field is shown to be a significant factor. This recognition by academic authors of the importance of a journal's level of usage provides encouragement for the development of a usage-based quantitative measure.

**Figure 5: Academic authors' views on the relative importance of four key aspects of journal publishing when considering where to submit their work for publication**

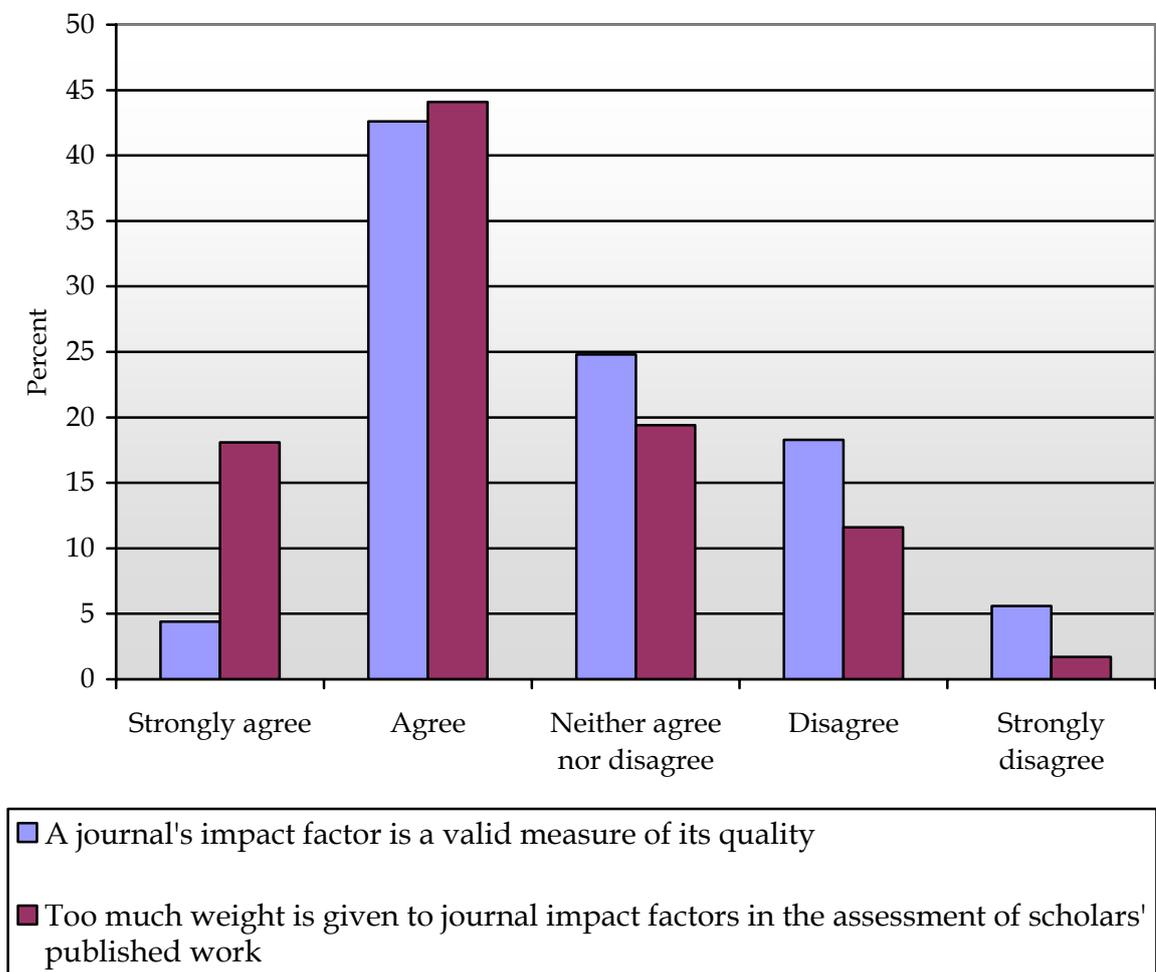


## Journal Impact Factors

Nearly half of academic authors believe a journal's Impact Factor to be a valid measure of its quality. The data presented in figure 6 indicate that this endorsement is not overwhelming: whereas 47% of authors either strongly agree or agree that Impact Factor is a valid measure of quality, 24% either strongly disagree or disagree, and 25% take a neutral stance.

Overall there is a higher level of agreement with the following statement: too much weight is given to journal Impact Factors in the assessment of scholars' published work. 62.5% of academic authors either strongly agree or agree that this is the case, compared to just 13% that either disagree strongly or disagree. 19% had no particular opinion either way.

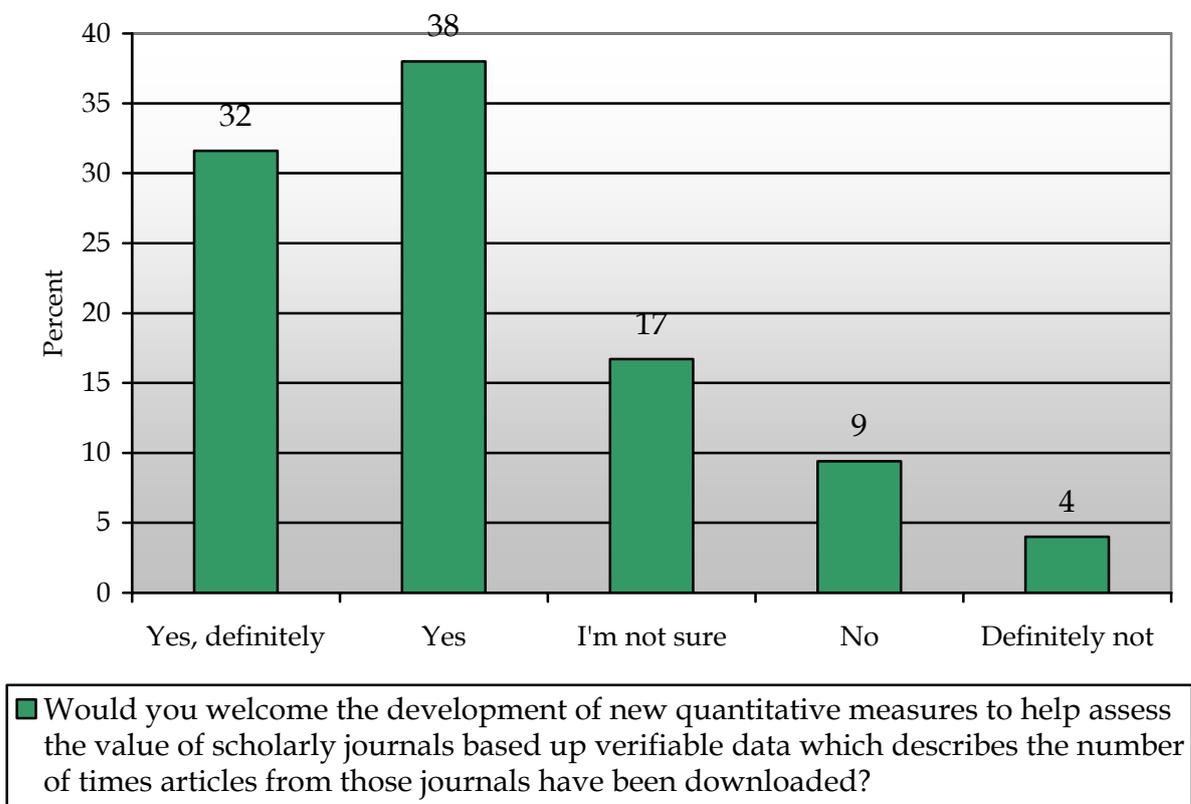
**Figure 6: Academic authors' views on the value and use of journal Impact Factors**



### Authors' interest in the development of a Usage Factor

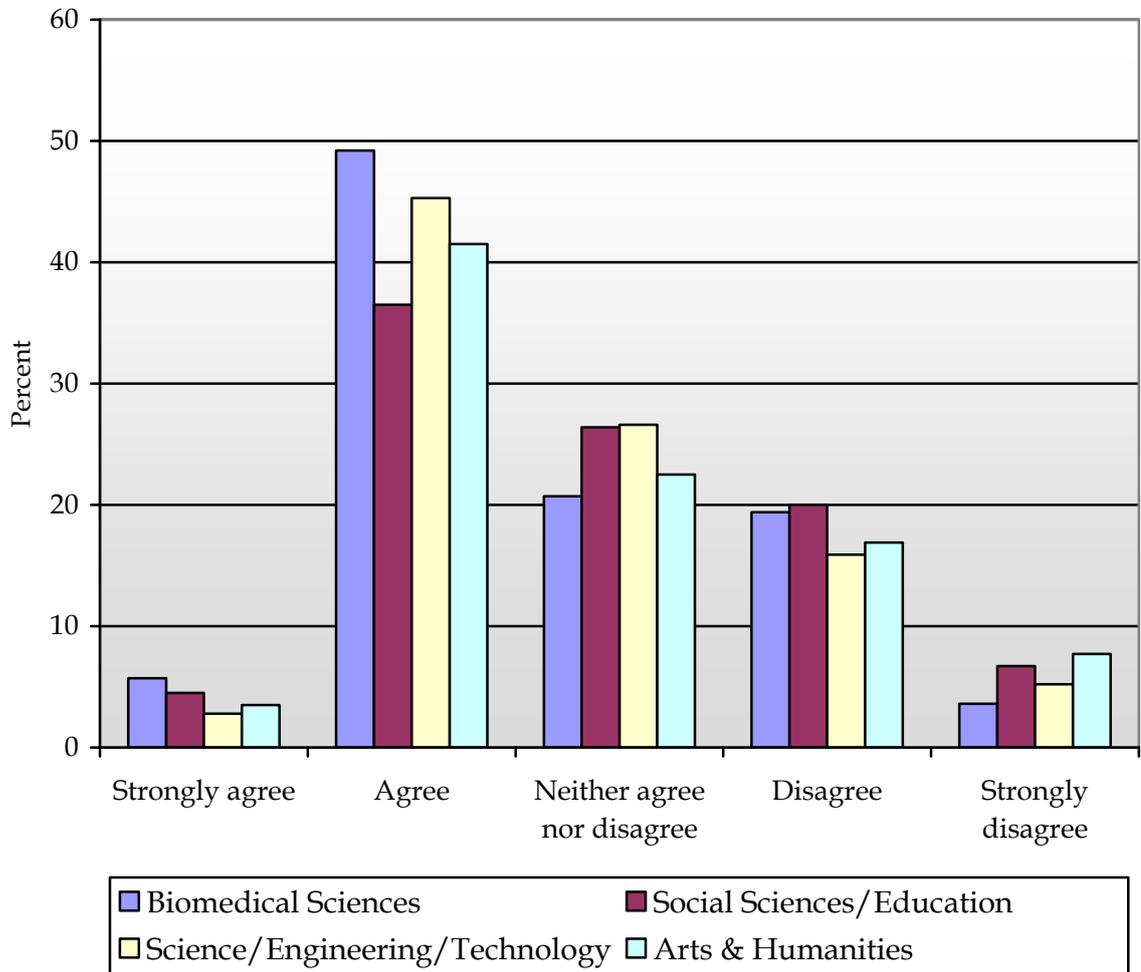
Finally, authors were asked the following question: *Would you welcome the development of new quantitative measures to help assess the value of scholarly journals based upon verifiable data which describes the number of times articles from those journals have been downloaded?* The pattern of responses, presented in figure 7, is clearly positive. 70% of academic authors said yes, definitely or yes in response to the question.

**Figure 7: Proportions of academic authors who would welcome a new measure for the assessment of the value of scholarly journals based on article downloads**



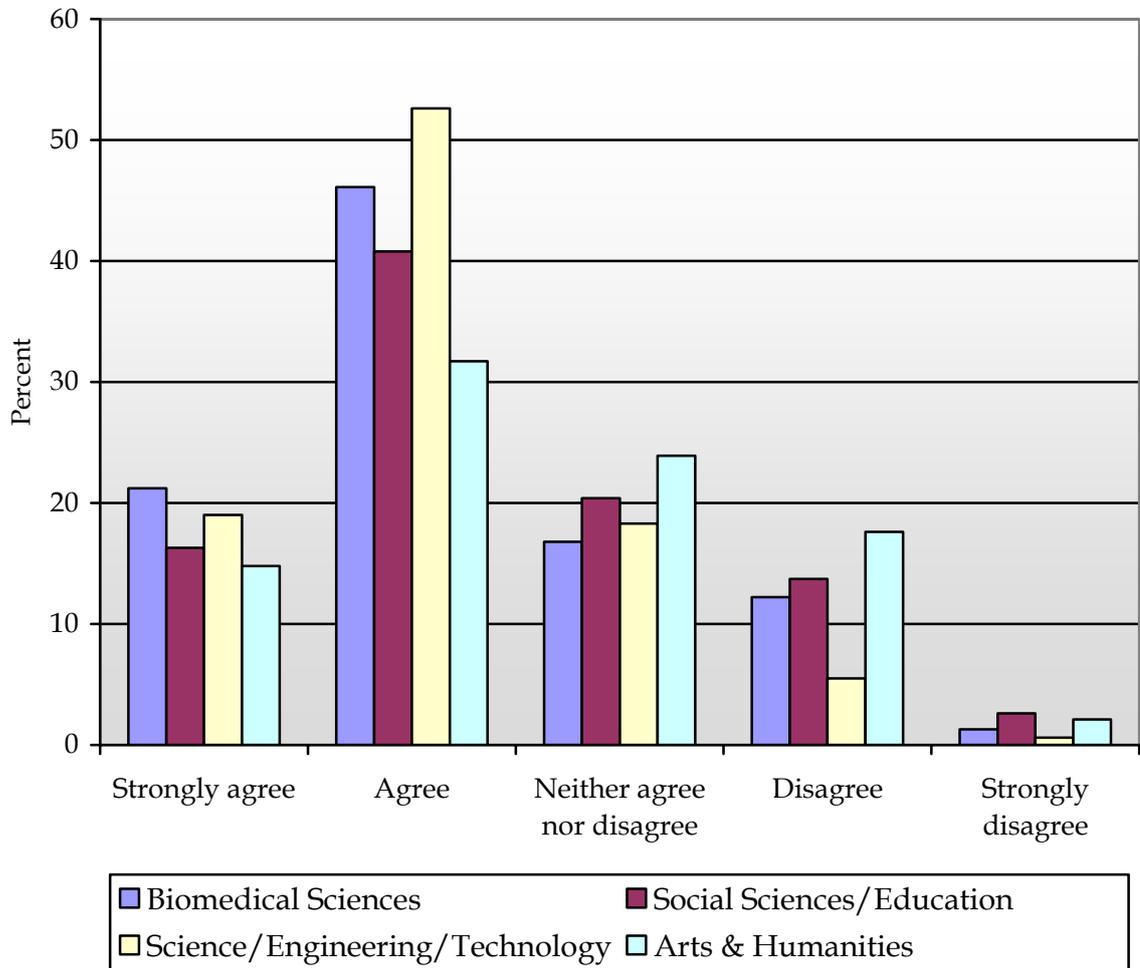
**Figure 8: Academic authors' views on the validity of journal Impact Factors for measuring journal quality [by broad subject area]**

Authors were asked: To what extent do you agree or disagree with the following statement? *A journal's Impact Factor is a valid measure of its quality*



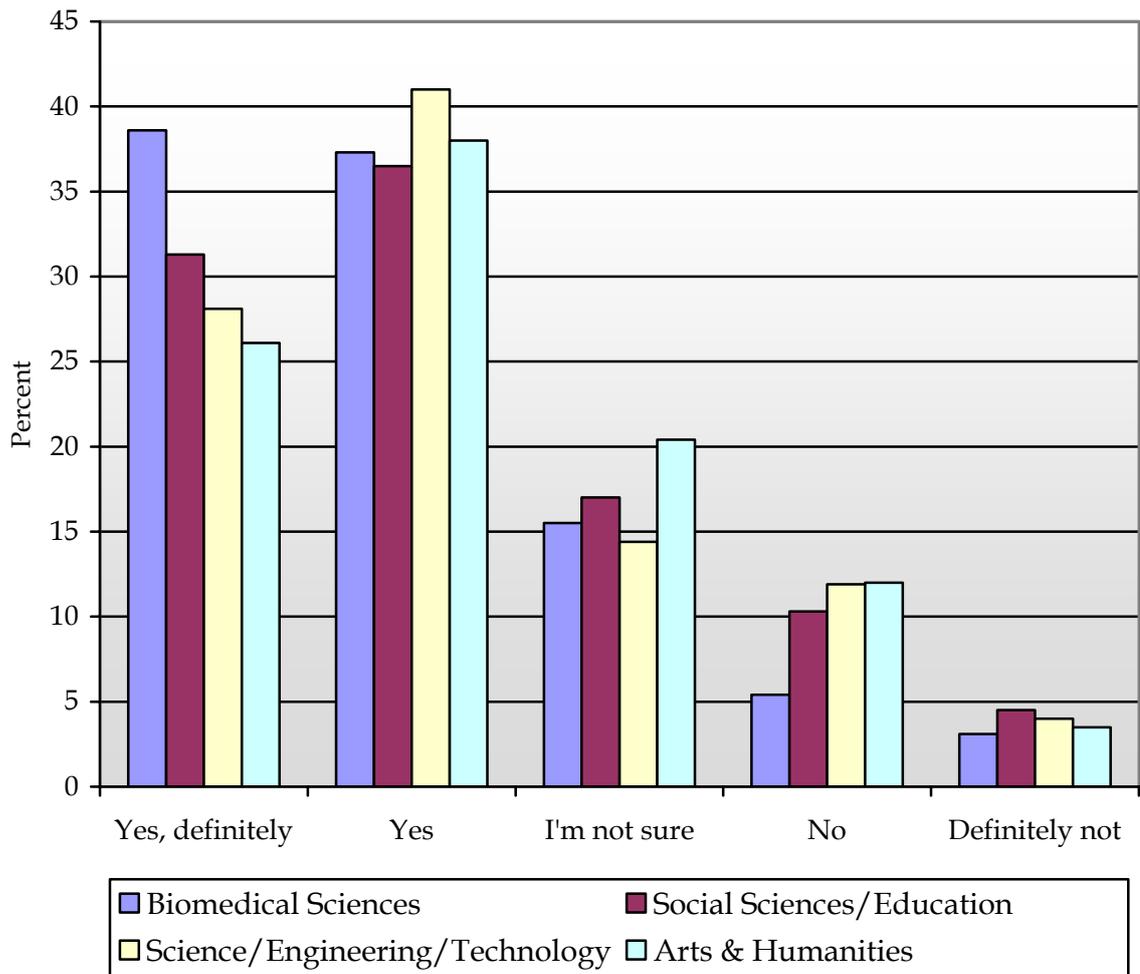
**Figure 9: Academic authors' views on the use of journal Impact Factors for assessment purposes [by broad subject area]**

Authors were asked: To what extent do you agree or disagree with the following statement?  
*Too much weight is given to journal Impact Factors in the assessment of scholars' published work.*



**Figure 10: Proportions of academic authors who would welcome a new measure for the assessment of the value of scholarly journals based on article downloads [by broad subject area]**

Authors were asked: Would you welcome the development of new quantitative measures to help assess the value of scholarly journals based upon verifiable data which describes the number of times articles from those journals have been downloaded?



## 4. Conclusions and Recommendations

### a. Conclusions

A number of conclusions can be drawn from the results reported in Section 4 above:

**Impact Factor:** IF, for all its faults, is entrenched, accepted and widely used. Over 70% of authors surveyed considered IF either a 'very important' or 'important' factor when considering where to submit their work for publication. On the other hand less than 50% of authors surveyed think that a journal's IF is a valid measure of its quality, while over 60% think that too much weight is given to IFs when assessing scholars' published work. There is a strong desire on the part of authors, librarians and most publishers to develop a credible alternative to IF that will provide a more universal, quantitative, comparable measure of journal value. It is generally acknowledged that no such alternative currently exists, but that usage data could be the basis for such a measure in the future. 70% of authors surveyed would welcome a new, usage-based measure of the value of scholarly journals.

**Differences between academic disciplines in attitudes to IFs and UFs** There were not significant differences between authors in different academic disciplines on the validity of IFs as a measure of journal quality, or on the desirability of a new, usage-based measure of journal value. The attitudes of biomedical scientists and arts/humanities scholars might have been expected to have diverged significantly, but they did not.

Confidence in the COUNTER usage statistics: while there is growing confidence among librarians in the reliability of the COUNTER usage statistics, two current weaknesses would have to be remedied before a COUNTER-based UF would have similar status to IF. First, the COUNTER usage statistics would have to be independently audited to ensure true comparability between publishers. (Auditing will commence in 2007). Second, the number of COUNTER-compliant publishers, aggregators and other online journal hosts will have to increase significantly.

Google page rankings: while some authors and publishers are dismissive of Google page rankings, all acknowledge the growing importance of search engines as a route to their articles. The majority also think it is important for their articles to be highly placed in Google rankings and most publishers deploy strategies to optimize the position of their articles in Google rankings.

All authors and librarians interviewed thought that Usage Factor would be helpful in assessing the value, status and relevance of a journal. (These results were confirmed by the much larger sample of authors and librarians in the web survey.) The majority of the publishers also thought it would be useful, but their support would depend on their confidence in the basis for the UF calculation (Equation 1). Key issues to address in this calculation are:

- Total usage: while it is generally agreed that only COUNTER-compliant usage should be included, there are currently insufficient COUNTER-compliant publishers and aggregators compliant to allow such a calculation to be anything like global for the majority of journals. Moreover, the number of sites on which the full text of a particular article will be available is likely to grow in the future, as a result of an increase in open access publishing and institutional repositories. This will increase the difficulty in obtaining a 100% global figure for journal usage. This need not be an insurmountable obstacle to the calculation of comparable UFs, but it is a potential problem. On balance it would appear to be more practical for publishers, rather than librarians or a third party, to consolidate the usage data and do the UF calculation, which would have to be independently audited. There was almost universal acceptance that a global UF per journal is desirable, while the desire for national or institute UFs was largely confined to librarians. Also mentioned was the desirability of an author-based UF that could be the usage-based equivalent of the Hirsch Index.
- Specified usage period: the majority of those interviewed thought that the specified usage period should be a calendar year. One publisher suggested that a two-year period (year of publication plus the following year), and this is worth further consideration, as it takes into account two significant peaks in usage; the first peak occurs when an article is published, the second when it begins to be cited. (The *quid pro quo* would be that the specified publication period in the denominator of the equation be 1 year; see below.)
- Total number of articles published online: there are two facets to this part of the equation. First, the items to be counted: simply adopting the ISI definition of 'source items' may be inadequate for two reasons:
  - ISI covers a reviewed selection of scholarly journals; a methodology for identifying the items to be counted in the majority of journals would have to be agreed
  - there is a feeling that the ISI definition of 'source items' is too narrow and that other categories of content published in journals are part of the value offered and should be counted

The second facet of Equation 1 that was the subject of debate was the specified publication period. Arguments were advanced for this being short (2 years maximum) and being long (5 years +), as well as for having UFs covering more than one period. At this stage there is insufficient data to support the selection of any of these options; nor would it be appropriate simply to plump for the two year publication period on the basis that ISI use this period. Tests using real data will be required before any firm conclusions can be drawn.

One or two respondents thought that the number of users per journal should also be taken into account, as high circulation/high user-numbers will tend to increase the UF. This is,

however, a fact of life that is well understood. It would add considerably to the complexity of the process to collect and audit figures on user numbers for each journal.

Ranking journals by UF: While the great majority of authors were in favour of ranking journals by UF, there was less unanimity among the publishers. Indeed the publisher responses, both positive and negative, tended to be qualified. The majority were positive, but need to be convinced that the UF calculation would be robust and fair. The minority who were negative appeared to accept that such rankings are going to happen in any event and they would rather it is done by an organization that they trust. Librarians indicated that, if UF were available, it would become the second most important factor ( after 'feedback from library users') in decisions in the purchase of new journals, while it would be the third most important factor ( after 'feedback from library users' and 'usage') in retention/cancellation decisions.

Organizations that could compile and comment on UF data: there is no existing organization which commands the confidence of both librarians and publishers **and** has the capability to compile/comment on UF data. Librarians, on the whole, do not trust publisher-only organizations and publishers, on the whole, do not trust librarian-only organizations, to fill this role. Indeed, it may require a partnership between organizations. The type of organization required will depend on the role to be filled. If, for example, publishers were to be responsible for the consolidation and calculation (audited) of UFs, a much smaller central UF organization would be required than if it were to be responsible for the consolidation of usage data, calculation of UFs and publication of UFs. There is a strong feeling that UFs should not become the basis for a major new commercial enterprise. It is clear that COUNTER has built up a considerable reserve of credibility among librarians, and publishers and could play a role in the definition, implementation and dissemination of UFs, probably in partnership with another body.

The majority of publishers appear to be willing, in principle, to calculate and publish UFs for their journals, according to an agreed international standard and appreciate that there would be benefits to them in doing so. Some publishers are more reluctant than others, but would go with the flow, if UF were defined and implemented in a way that is acceptable to the market.

In summary, there is significantly stronger support, especially among publishers, for the development and implementation of journal Usage Factors than one would have anticipated at the outset of this survey. Having said that, the survey has brought into focus an number of structural questions that will have to be dealt with if journal UFs are to be credible. The most important of these are:

- it is easier to systematically inflate online usage data than it is to inflate citation data. Moreover, the advent of journal UFs would give publishers a stronger motivation to inflate usage. Is COUNTER sufficiently robust to control this?
- coverage of 100% of an online journal's global usage is probably not a realistic goal for most journals in an increasingly distributed publishing environment. What coverage is required to have comparable, credible journal UFs?
- large collections of content hosted in a single online service tend to have an amplifying effect on usage of individual items within that service. Will this provide the larger publishers with an inbuilt advantage resulting in higher journal UFs?
- a typical large academic library subscribes to over 20,000 journals. Only around 8000 journals are covered by the Science Citation Index, which records for these journals the number of 'source items' included in the journal Impact Factor calculations. One perceived advantage of UFs is that they could in theory cover **all** online journals. What would be an acceptable basis for working out of the number of articles/items to be included in the UF calculation?
- print usage is not covered by COUNTER. Will its omission undermine the credibility of UF?

## b. Recommendations

Given the strength of apparent support for the development of journal UFs and the growing confidence in COUNTER usage data, it is recommended that the UF concept be developed further, with a view to testing it as a practical, implementable measure of journal quality, value and status.

### Recommendations to UKSG for further development of UF:

#### *Journal UFs*

- test each of the individual elements in the UF equation using real publisher usage data:
  - total usage: the practicality of publishers consolidating the usage statistics for their journals from a variety of sites; specified usage periods of 1 or 2 calendar years; viability of local UFs; proportion of global usage required for a meaningful, comparable UF.
  - total number of articles published online: definition of items to be covered; specified publication period (short vs. long). Note: as there is not a large archive of COUNTER compliant data, testing the longer time periods will be difficult at this stage.
- compare UF journal rankings with IF journal rankings
- approach selected organizations to participate in funding further research.
- identify a list of candidates that could fill the role of 'consolidating organizations'.
- refine and investigate further the different workflow/organizational scenarios for the definition, calculation and dissemination of UFs
- if satisfactory results are obtained from the above investigations and tests, it is likely that the system would have to be tested for one or two years to check the large scale validity of the outcomes before a comprehensive list of journal UFs is published.

#### *Individual author UFs*

Given the growing popularity of the Hirsch index, especially in the US (2), as a citation-based measure of the impact of the publications of individual scientists rather than of journals, it could be very valuable to explore the feasibility of developing UFs for individuals, as well as for journals. In simple terms a scientist has a Hirsch index  $h$  if  $h$  of his  $N_p$  papers have at least  $h$  citations each, and the other  $(N_p - h)$  papers have at most  $h$  citations each. The Hirsch index is designed to distinguish the truly distinguished scientists from those who simply publish many papers. In principle a parallel usage-based, scholar-centric metric could be developed. Online web programs are available to directly calculate a scholar's Hirsch index.

### Recommendations for COUNTER

- continue to expand the number of COUNTER-compliant vendors, with a particular focus on aggregators, open access publishers, subject repositories and institutional repositories
- implement the independent audit
- review the mechanisms designed to prevent inappropriate vendor inflation of usage statistics
- assess the viability of expanding the definition of the items covered in Journal Report 1

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