Quantifying the Impact of Research for Tenure and Promotion in Family and Consumer Sciences

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This paper provides an overview of different metrics to quantify the impact of scholarly work in Family and Consumer Sciences, for scholars involved in the tenure and promotion process. Even though each institution will have their set of rules, most professors in university settings are increasingly subjected to monitoring and evaluation of their research outputs. This paper describes several metrics that are valid and reliable including age of the journal, acceptance rate, ISI impact factors, the SJR journal ranking, and the journals' h-index. Two author-level metrics, the Hirsh h-index and the HLA index, are described. In the remainder of the article, three other quantifiable criteria are included.

Keywords: ISI impact factor; SJR journal ranking; h-index; HLA index

Publishing in academic journals is an important part of the story that scholars in academia need to tell when they are seeking tenure and promotion. But demonstrating the impact of their scholarly work is not an easy task. What metrics for scholarly assessment are available in Family and Consumer Sciences (FCS)? Research impact metrics in FCS are challenging because FCS, as a field of study, is an interdisciplinary profession (Schuchardt et al., 2007). FCS journals are indexed across different subject areas and in different categories.

Such epistemological nuances mirror the work field. Professionals in FCS may have expertise in one or more of the following subjects: human development and family studies, consumer education, design and environment, social and economic issues, family financial management, food marketing, food studies, consumer advocacy, consumer protection, health and nutrition, housing and interior, and apparel merchandising, just to name a few. It is seldom the case that a FCS scholar works in only one of the subject areas described above.

To fill a large gap, this paper presents ideas and metrics on how to quantify the impact of research in FCS for tenure and promotion purposes. The paper will review metrics of scholarly work, such as age of the journal, acceptance rate, and description of the review process (single- or double-blind reviews). The paper will also discuss the ISI impact factor and newer metrics such as the SJR journal ranking and the journals' h-index. Because citations are evidence of

impact, two author-level metrics will be addressed. Finally, less conventional metrics are presented, including calculation of the number of co-authors per paper, the length of manuscripts, and the use of an indicator available in ResearchGate (RG), which shows how much exposure the scholar's work is getting using "download/reads."

TRADITIONAL METRICS

Age of the Journal, Acceptance Rate, and the Review Process

If it is assumed that the bulk of a scholar's publications must come from peer-reviewed journals, then FCS scholars face the task of providing evidence on the quality of the outlets in which they have chosen to publish their work. The focus and scope of the journal, its longevity, its acceptance rate, and the review process provide indicators of quality and prestige of refereed professional journals.

The name of the journal provides clues regarding its focus (e.g., *Journal of Consumer Affairs; Family Relations*). The name may describe a specific subfield (e.g., *Housing and Society; Family Process*) or their national or international scope (e.g., *Journal of the Home Economics Institute of Australia; International Journal of Consumer Issues*). Some FCS journals target an intended audience. For example, the audience and journal title are as follows: extension professionals (*Journal of Extension*), practitioners (*Journal of Financial Counseling and Planning*), and researchers (*Family and Consumer Sciences Research Journal*). There are refereed journals called forums (*The Forum for Family and Consumer Issues, Kappa Omicron Nu Forum*). Forums consist of a number of high-quality, short articles by different authors that might encourage conversations among different sections of the subfield. Forums could include new, cutting edge practical ideas and/or innovations which make them appealing to broader audiences.

One indicator of the quality of a journal is the trajectory and longevity of the journal. The volume number tells how many years a journal has been in existence (e.g., Volume 48 means 48 years). Many journals in FCS have a long tradition in academia, with a publishing history of over 100 years (e.g., *Family and Consumer Sciences Research Journal, Journal of Family & Consumer Sciences*). Also, *Housing and Society*, *Journal of Marriage and Family Review,* and the *Journal of Consumer Affairs,* each have been published for about 50 years.

Another indicator of quality is the journal's acceptance rate. The average acceptance rate of FCS journals is about 37% (with a range of 15%–60%). Acceptance rates vary greatly within the discipline and whether the journal is applied or research-oriented. Some journals post their acceptance rates on their website (e.g., *Journal of Extension* indicates that their acceptance rate is 20.2% [JOE, n.d.]). For journals that do not post their acceptance rate, the candidate for tenure and promotion would need to contact the editor to obtain that information.

If the scholar works in a specialized subfield within FCS, some journals are ideal outlets for their publications. These journals are self-published by supporting professional organizations, for example, the *Financial Therapy Journal*, published by the Financial Therapy Association; *Journal of Financial Counseling and Planning*, published by the Association for Financial Counseling and Planning Education; and *Housing and Society*, published by the Housing Educator and Research Association. These journals may be smaller compared to

journals managed by huge publishing firms like Sage, Taylor and Francis, Reed Elsevier, Springer, John Wiley & Sons (Blackwell), Kluwer Academic (McGregor, 2014), but that does not mean that they are not as rigorous as the others. The burden of proof on the relevance of why this smaller journal is the best outlet to disseminate a scholar's work is up to the candidate; he or she will need to contextualize how prestigious the journal is within the particular subfield.

If the journal is peer-reviewed (often called a refereed journal), there will be a large number of qualified reviewers that the editor turns to as each paper comes in for consideration. It is possible that editors screen all incoming manuscripts to see whether they are suitable for the journal. If not, papers will be editor-rejected and will not be sent for review.

There are different types of peer-reviewed processes: (i) Double blind: neither the author(s) nor the reviewers know each other's identity; (ii) single blind: the reviewer(s) knows the author's name but the author(s) does not know the reviewers; (iii) open review (no blind): both author(s) and reviewers know each other's identity; (iv) editor reviewed (no peer reviewers are involved, per se); and (v) committee reviewed. The latter may be conducted for conference proceedings that have an editorial committee reviewing submissions in which various degrees of "blindness" may exist (McGregor, 2014). The time required to review manuscripts may also affect the impact of a scholar's work. If reviewing and publishing are delayed, references to articles that are no longer timely may not be included in future manuscripts. A scholar's work is more likely to have an impact if the review process moves quickly.

In addition to refereed journal articles, the FCS candidate for tenure or promotion may want to consider explaining the review process of conference proceedings in his/her field or subfield. This is especially important when conference proceeding publications are double blind, in which both the reviewers' and author's identities are concealed. In most applied disciplines (including FCS), conference proceedings are respected and valuable venues for disseminating knowledge. About 5% of academic outputs in interdisciplinary fields are peer-reviewed conference proceedings (London School of Economics Public Policy Group, n.d.). Google Scholar, the most adequate citation engine for scholars in the social sciences, includes conference proceedings as part of their citation metrics (Harzing, 2011).

Most of the conference proceedings in FCS meet high standards with double-blind refereed reviews (both the reviewers' and author's identities are unknown to each other). Given that consumer sciences' grants are relatively small compared to grants in the hard sciences, refereed conference proceedings are a valuable venue to disseminate pilot studies and research in progress. The average length required for a conference publication in FCS is between 1,000 and 2,000 words. Publications in conference proceedings are also a way to publish with graduate students. Mentorship of graduate students is important, not only because of the knowledge and skills students learn from their mentors, but also because mentoring provides professional socialization.

ISI Impact Factors, SJR Journal Rank, and H-index

In the 1960s, Drs. Eugene Garfield and Irving H. Sher created the journal impact factor to help select journals for the Science Citation Index (SCI). This impact factor came to be known as the Thompson Reuters Impact Factor (Garfield,

1998) and it is a common metric to demonstrate the impact of scholarly work. The ISI impact factor is calculated by dividing the number of citations in the Journal Citation Report (JCR) year by the total number of articles published in the two previous years. An impact factor of 1.0 means that, *on average*, the articles published 1 or 2 years ago have been cited one time. An impact factor of 2.5 means that, on average, the articles published 1 or 2 years ago have been cited two and a half times (Web of Science n.d.a).

ISI impact factors can be a valuable measurement of academic journals *within* a discipline (e.g., biology, physics). However, impact factors are not appropriate in interdisciplinary fields or when comparing *across* disciplines. Due to the interdisciplinary nature of FCS, several respected journals have not obtained ranking in the ISI's JCR. Thus, traditional citation metrics, such as those provided by ISI-JCR, may be used to in addition to other kind of indexes.

Family and Consumer Sciences scholars can turn to newer bibliographic databases. Scopus, a database of peer-reviewed literature, provides another index to measuring the relative journal standing within a subject category. Their index is called the SCImago Journal Rank (SJR) indicator. The SJR measures the scientific influence of the average article in a journal. It is computed using the same formula that the Thompson Reuters uses (SCImago, 2007). The Scopus website provides a plethora of information on more than 20,000 journals including the journal h-index and the journal rank within the subject category.

In addition to the SJR indicator, SCImago website, powered by Scopus, also provides the h-index of the journal. Commonly used as an author-level metric, the so-called Hirsch index (or h-index) developed by Hirsch (2005) is a metric that attempts to measure the productivity and citation impact of the publications of a scientist or scholar. The h-index can be used as both as an author-level metric and as a journal impact factor. More recently, the h-index has gradually evolved to become an alternative to more traditional journal impact factors. Parallel to what the h-index author describes, the h-index for a journal expresses the journal's number of articles that have received h-citations in the last two years. In both metrics, the higher the h-index of the journal suggests that the impact is greater.

Similarly, the SCImago website offers the SCImago Journal Rank by quartiles. The quartile ranking is a measure of the journal's impact, influence, and prestige of the journal in a specific area and within a subject category. Quartile 1 means the highest value and Quartile 4 represents the lowest value (SCImago, 2007). For example, the Family and Consumer Sciences Research Journal (FCSRJ) is grouped in the social sciences area, within the cultural studies category. In 2012–2014, the FCSRJ was ranked in the first quartile, moving up from Q2 in 2011.

To provide evidence of the stature of the journals in which the candidate for tenure and promotion has published, FCS scholars can search in the SCI-Scopus journal ranking website for the ranking of the journal by quartile, the h-index of each journal, and the journal country of origin. With that information, they can create a table similar to Table 1.

According to SCI-Scopus, all the FCS journals are categorized in social sciences-related disciplines, including sociology/political sciences, business, accounting, finance, education, cultural studies, applied psychology, and economics. This categorization mirrors similar groupings of the social sciences discipline prepared by Harzing, Alakangas, and Adams (2014). According to Harzing et al. (2014), the social sciences field comprises disciplines like social

TABLE 1:   Sample of Journals in FCS, Their h-Index, Journal Ranking Quartile, Subject Area and Categories, SJR Journal Rank and ISI Impact Factors

Title of journal	Journal h-index [a]	Journal ranking[a]	Subject area/ Category[a]	SJR indicator[a]	Impact factor
Economics focus					
International Journal of Consumer Studies	11	Q2	Economics	0.548	1.293[b]
Journal of Extension	19	Q3	SS	0.233	n.a.
Family and Consumer Sciences Research Journal	6	Q1	SS/Cultural studies	0.349	n.a.
Nurture	0	Q4	SS	0.103	n.a.
Family focus					
Family Relations	56	Q1	SS/Psych	0.856	1.024[c]
Journal of Marriage and Family	107	Q1	Social Sciences	1.542	1.770[d]
Journal of Family Issues	54	Q1	Social Sciences	0.682	1.269[e]
Marriage and Family Review	26	Q2	Social Sciences	0.309	n.a.
Family Process	48	Q1	SS/Psych	0.935	3.000[f]
Consumer focus					
Journal of Consumer Affairs	38	Q1	Economics	0.776	1.590[g]
Journal of Consumer Policy	27	Q2	Economics	0.681	1.048[h]
Journal of Financial Counseling and Planning	21	Q2	Economics	0.523	n.a.
Journal of Family and Economic Issues	29	Q2	Economics	0.574	1.058[i]
Journal of Consumer Research	109	Q1	Economics	3.98	3.125[j]
Journal of Consumer Culture	31	Q1	SS/Economics	1.688	1.194[k]
Journal of Consumer Psychology	63	Q1	Psychology	2.089	2.243[l]
Journal of Consumer Behavior	14	Q2	Psychology	0.625	0.714[m]
Textile focus					
Clothing and Textiles Research Journal	20	Q2	Materials Science	0.444	0.750[n]
Journal of Retailing	85	Q1	Business	2.326	1.754[o]
Journal of Retailing and Consumer Services	39	Q2	Business	0.657	1.249[p]
Housing focus					
Housing Studies	46	Q1	SS	0.738	0.991[q]
Journal of Housing and the Built Environment	24	Q2	SS	0.482	0.657[r]
Journal of Housing Economics	30	Q2	Economics	0.717	0.500[s]

NOTE: Table developed by author on November 2, 2015. SS, Social sciences; Psych, Psychology; n.a, not available.Sources:
[a]SCImago Journal & Country Rank. http://www.scimagojr.com.
[b]http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291470-6431.
[c]http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291741-3729.
[d]http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291741-3737.
[e]http://jfi.sagepub.com/.
[f]http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291545-5300.
[g]http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291745-6606/.
[h]http://www.springer.com/social+sciences/journal/10603.
[i]http://www.springer.com/social+sciences/journal/10834.
[j]http://jcr.oxfordjournals.org/.
[k]http://joc.sagepub.com/.
[l]http://www.journals.elsevier.com/journal-of-consumer-psychology/.
[m]http://onlinelibrary.wiley.com/journal/10.1002/%28ISSN%291479-1838.
[n]http://ctr.sagepub.com/.
[o]http://www.journals.elsevier.com/journal-of-retailing/.
[p]http://www.journals.elsevier.com/journal-of-retailing-and-consumer-services/.
[q]http://www.journals.elsevier.com/journal-of-retailing-and-consumer-services/.
[r]http://www.springer.com/social+sciences/population+studies/journal/10901.
[s]http://www.journals.elsevier.com/journal-of-housing-economics/.

and political sciences, accounting and finance, economics, education, management and marketing, and applied psychology.

AUTHOR-LEVEL METRICS: CITATION TRACKING AND H-INDICES

At some academic institutions, the use of journal impact factors instead of the scholar actual h-index could be controversial. Therefore, it is recommended that candidates for tenure and promotion provide (i) their h-index, as evidence of both their productivity and citation impact of their publications, in addition to (ii) the h-index of the journals in which they have published.

There are three databases for citation analysis: Web of Science, Scopus, and Google Scholar. Web of Science (WoS) is one of the largest platforms with the most complete records in every subject. The Web of Science homepage claims that they have over 90 million records covering 5,300 publications in 55 disciplines, more than 800 million cited references, and about 8.2 million records of 160,000 conference proceedings (Web of Science, n.d.b).

In 2004, two competitors to WoS emerged—Scopus from Elsevier and Google Scholar from Google. Scopus is the largest abstract and citation database of peer-reviewed literature that includes scientific journals, books, and conference proceedings (Elsevier, n.d.). Scopus delivers a broad overview of global scientific information. About 15% of the Scopus publications come from the Life Sciences, 24% from social sciences, 29% from physical sciences, and 32% from health sciences. It covers nearly 22,000 titles from over 5,000 publishers, of which 20,000 are peer-reviewed journals in the scientific, technical, medical, and social sciences (including arts and humanities; Wikipedia n.d.a).

Google Scholar is a freely accessible web engine that indexes the full text of scholarly literature across an array of publishing formats and disciplines. Released in November 2004, the Google Scholar index includes most peer-reviewed online journals from Europe and the United States (Wikipedia, n.d.b). While Google does not publish the size of Google Scholar's database, Orduna-Malea, Ayllon, Martin-Martin, and Lopez-Cozar (2014) estimated it contains about 160 million documents as of May 2014. Google Scholar includes peer-reviewed papers, theses, books, abstracts from conference proceedings, articles from academic publishers and professional societies, preprint repositories from universities, and other scholarly organizations.

In FCS, WoS can lead to low citation counts. Scopus has a more user-friendly interface than WoS and good coverage from social sciences disciples, and it is more internationally focused than WoS. Google Scholar, on the other hand, provides the most comprehensive picture of scholarly impact as it also indexes nontraditional sources not covered by WoS or Scopus. Kousha and Thelwall (2007) stated that Google Scholar citations were more numerous than WoS citations in computer science and four social science disciplines (psychology, sociology, economics, and education), suggesting that Google Scholar is more comprehensive for social sciences [and perhaps for FCS]. Moreover, Google Scholar accounts for conference article proceedings that are published online (Kousha & Thelwall, 2007).

Given that FCS scholars come from multidisciplinary fields, and the fact that we value conference publications, I suggest that the Google Scholar h-index is an adequate measure of research impact. An inspection of my Google h-index

and an item-by-item journal article analysis showed that more than 95% of my citations that compose my h-index are from academic journals, with the remainder appearing from two extension fact sheets and one online conference proceedings.

While the author-level h-index is a good indicator of scholarly impact, Harzing (2011) posits that the h-index cannot be used to compare academics that work in *different* disciplines or are at *different career stages*. Therefore, she proposed an additional metric to correct for these deficiencies, namely the HLA index. The HLA index normalizes the h-index by taking into account disciplinary and career length differences. In other words, the HLA index represents the (*estimated*) annual increase in the individual h-index by year for an academic in a specific field of study. Currently, there is no average HLA index exclusively for FCS. For this, we would need a sample of FCS scholars representing a broad range of career lengths. Nevertheless, I will provide an example of how FCS scholars can make their case for tenure and promotion if they use the social sciences group as their frame of reference. The HLA index for the social sciences is the closest we can get to a normalized index in FCS.

Harzing (2011) has calculated the HLA index for scholars in the social sciences field. After all, the main identified subject areas and categories for many of the FCS journals—except perhaps for the apparel and textiles journals listed by Scopus—are under the social sciences area. The grouping of disciplines developed by Harzing is the social sciences grouping that includes categories such as accounting, finance, economics, education, management and marketing, psychology, and social and political sciences. To understand how the h-index and the normalized h-index (HLA) work, consider the following example.

Let us assume that there is one FCS scholar with an h-index = 8 and 15 years in academia. A Google h-index = 8 means that at least eight articles have at least eight citations per article. To put things in context, Harzing (2011) suggests that the estimated average h-index for a scholar in the social sciences, who has been in academia for 19.5 years, is 9.83, and their respective estimated HLA index would 0.37. Because our FCS scholar has an index of 8, with 15 years in the academia, his or her estimated HLA index would be 0.55, which is 48% higher than the estimated average for scholars in the social sciences with almost 20 years in the academia. Based on this parameter, the *expected* h-index after 19 years in academia for our FCS scholar would be h = 7.44. As a reminder, I assumed this scholar was already at h-index = 8 with 15 years in academia.

OTHER METRICS FOR IMPACT AND PRODUCTIVITY

Number of Authors per Paper

One important requirement for tenure and promotion is providing context for one's productivity and work. A published paper by a single author is different than a published paper with five or more authors. In the tenure and promotion documentation, it is important to differentiate numbers of papers with solo authorship versus the numbers of papers with collaborators. In the latter case, candidates for tenure and promotion should indicate what their role on the published paper was and whether the authors of the paper were alphabetically listed or listed in a way that represents the amount of each author's

contribution. They should also note whether some of the co-authors were graduate students. This would be an opportunity to highlight their work as mentors.

The average number of authors per paper is calculated by adding the number of authors involved divided by the total number of papers. In my case, for example, the ratio of number of authors per paper is virtually 1.10, which is lower than the average number of authors per paper in the social sciences (2.62). Published conference proceedings are excluded from this ratio. To put things in context, according to Harzing et al. (2014), in the Social Sciences, "The average number of authors per paper is 2.62 compared to sciences (4.66) and life sciences (6.22)."

Length of Papers

The length of the paper is another indicator of the effort and productivity that should be explained in the tenure and promotion documentation. For example, in medicine, all published papers are written with a word limit of 3,000 words (LSE, n.d.), while the norm in FCS is around 5,000 words, with a range of 2,000 words for research notes to no stated length suggested by the journal. Harzing (2011) notes that "The typical article in the Social Sciences is 20 pages long; it often requires three time-consuming rounds of revisions before it is accepted for a major journal. A typical paper in medicine/sciences is only 2–5 pages long and it requires fewer revisions" (Harzing, 2011, p. 230). The average length of each of my published manuscripts is about 5,572 words (ranging from 2,251 to 10,472 words), which translates into an average of about 20 pages per article (about par with the standard for FCS).

Learning Who is Reading Your Papers

The last indicator within the less traditional metrics is found on the ResearchGate (RG) website. RG has a feature called "number of reads/downloads." This feature is very useful to show indirect impact, not by actual citations of one's work—which is also found in RG—but by an account of how many times a scholar's research has been read or downloaded. Under the statistics tab, RG provides daily and weekly readings for the scholar. In the details, one will find the readings by institution and by country. I learned that my work has been read not only by US scholars but also by scholars in 27 other countries around the world (Delgadillo, 2015).

CONCLUSIONS

In conclusion, this paper discussed traditional research productivity metrics, in addition to author-level metrics and other quantifiable criteria to demonstrate the impact of scholarly work. These metrics can be useful for tenure and promotion in FCS. Journal impact factors should be complemented with author-level metrics. The h-index and the HLA index were described. Because recently published articles may not have had enough time to be cited, this paper presented an alternative method to demonstrate impact by using statistics on the number of times a paper is read downloaded.

Most scholars in FCS will have traditional assignments that include teaching, research, and service, or teaching and extension, or combinations. Whatever track a new scholar is assigned and the respected weighted percentage of their responsibilities often make a large difference to the probabilities of subsequently publishing scholarly work.

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