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# Bibliometrics for Collection Development? A Study of the Publishing Habits of Math Faculty at Three Research Institutions

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## A study of the publishing habits of math faculty at three research institutions

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### Introduction and Background

Collection development within the changing landscape of space and budgetary constraints of the institution can be daunting work. It can be difficult to navigate the priorities du jour. However, it would be extremely advantageous for bibliographers and librarians to know the research interests of the disciplinary faculty when selecting and deselecting titles for the collection. In this study we evaluate the scholarly productivity of 29 faculty members at 3 peer institutions to identify a core list of mathematics journals that are important to scholars. We want to know where math faculty are publishing, and if the core list coincides with other measures of impact. We collected the journals published in by the faculty members and compared those to 5 standard metrics:

- Institute of Scientific Information Journal Citation Report (ISI) impact factor
- Scimago Journal Rank (SJR) indicator
- H-index
- Source Normalized Impact per Paper (SNIP)
- Eigenfactor.

The goal of this project is to **create a top tier mathematics and mathematics-related journals list to inform mathematics librarians and other subject specialists on what journals matter most to math faculty publishing, and to their departments.** This project hopes to find the intersection of library interests and departments' research interests, thereby creating a core list of journals to manage. Collection procedures and policies may change often due to department and university-level departmental shifts and may not stay current with the interests of users.

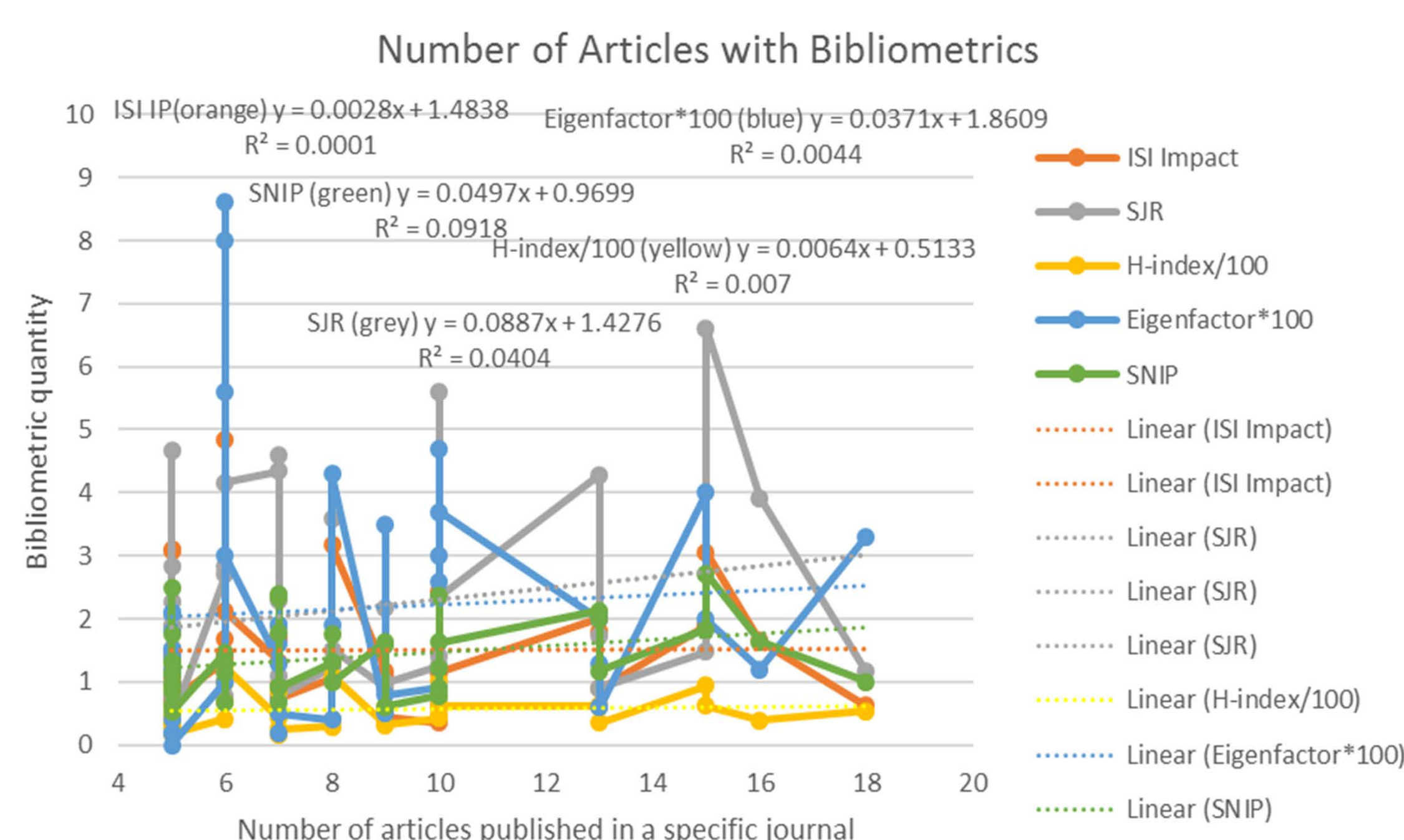
### Method

In order to develop a comprehensive list for analysis, we determined a specific set of criteria. First and foremost, journals must be peer-reviewed. Effort was made to have a senior faculty members who were eminent in the field, who could be able to publish in whichever journals they choose, and thus to capture their true preferences for journal venues.

During the period of 2000-2015, a list of publications was compiled for each faculty member. The journals were pooled from the popular databases Web of Science and Google Scholar. Cross-referencing both databases produced a more accurate list of publications for each author. Additionally, individual faculty web profile pages or online Curriculum Vitae (CVs) were consulted, if available. Some profiles were found to be insufficiently populated or out of the date at the time of data collection.

Frequent Journal Titles	# of References
ARXIV	18
Proceedings of the American Mathematical Society	18
Advances in Mathematics	16
Journal of American Mathematical Society	15
Communications in Mathematical Physics	15
Journal of Approximation Theory	13
SIAM Journal on Matrix Analysis and Applications	13
Journal of Functional Analysis	10
Journal of Algebra	10
Annals of Statistics	10
Journal of Mathematical Physics	10
Indiana University Mathematics Journal	10
Pacific Journal of Mathematics	9
Transactions of the American Mathematical Society	9
Constructive Approximation	9
Classical Quantum Gravity	8
Proceedings of the National Academy of Sciences	8
Journal für die reine und angewandte Mathematik	8
Nature	8
Communications in Contemporary Mathematics	7
Epidemiology and Infection	7
Duke Mathematical Journal	7

Journal Title	# of References
SIAM Journal on Numerical Analysis	7
Networks and Heterogeneous Media	7
Science	7
Geometric And Functional Analysis	7
Journal of the American Statistical Association	6
PLOS Computational Biology	6
SIAM Journal of Applied Mathematics	6
Journal of Physics A: Mathematical and General	6
Annales de l'Institut Henri Poincare. Annales: Analyse Non Lineaire/Nonlinear Analysis	6
Journal of Computational Analysis and Applications	5
Mathematics of Computation	5
Mathematische Zeitschrift	5
Mathematische Annalen	5
Journal of Agricultural, Biological and Environmental Statistics	5
Communications in Analysis and Geometry	5
Communications in Algebra	5
Biometrics	5
Communications on Pure and Applied Mathematics	5
Illinois Journal of Mathematics	5
International Mathematics Research Notices	5



### Results and Conclusions

A total of 919 publications were analyzed for the 29 faculty members studied. This included both conference proceedings and journal articles. The average number of publications was 29 per faculty member. The list yielded a total of **321 unique journal titles** and/or conference proceedings titles. There was a range of two (2) to 71 unique article journal titles per faculty member. **Forty-two journal titles were published in five (5) or more times by the faculty studied, (see Table 1) while only 12 journal titles were published in 10 or more times by the faculty of this study (indicating a very 'long tail' of publication venues by the faculty).**

Interestingly, **64 of the journals published in are not traditionally considered to be mathematics- specific titles**, rather they are interdisciplinary titles. Future work for collections research in mathematics should include researching the publishing network of mathematics faculty in other disciplines and institutions to understand the patterns and clusters that may exist. More work can be done to understand if there are patterns of research by individual faculty members or departments, thereby studying author-level metrics. Similar work can be done with the single institution to create a picture of intra-departmental collaboration.

Selected, Non-Math Journal Titles	# of references	Subject Area
American Journal of Botany	1	E
American Journal of Epidemiology	1	E
American Journal of Human Genetics	1	M
American Naturalist	4	E
Annals of Biomedical Engineering	1	M
Annals of Human Genetics	1	M
Annals of Physics	2	P
Bioinformatics	4	C
Biometrics	5	C
Biometrika	2	M
BMC Bioinformatics	1	C
Classical Quantum Gravity	8	P
Computing	1	C
Ecography	1	E
EcoHealth	1	M
Ecological Monographs	1	E
Ecology	3	E
Ecology Letters	1	E
Environmetrics	3	E
Epidemiology and Infection	5	M
Genome Research	1	M

Geophysical Journal International	1	E
Higher Education Press	1	
IEEE Transactions on Biomedical Engineering	2	M
IET Systems Biology	1	M
International Journal of Modern Physics	1	P
International Journal of Plant Science	2	E
Journal of Agricultural Biological and Environmental Statistics	5	E
Journal of Climate	1	E
Journal of Computational Electronics	1	C
Journal of Fluid Mechanics	1	
Journal of Geophysical Research-Atmosphere	2	E
Journal of Geophysical Research –Oceans	1	E
Journal of Mechanics and Physics of Solids	1	P
Journal of Modern Dynamics	2	
Journal of Physics A: Mathematical and General	6	P
Journal of Physics: Conference	3	P