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Dominance Index of Top 1% Researchers in Library and Information Science

Baharan Heidari[1] ✉, **Alireza Noruzi**[2], **Ch Peidu**[3]

1. Corresponding author, MSc. in Scientometrics, Department of Knowledge and Information Science, Faculty of Management, University of Tehran, Tehran, Iran. E-mail: baharan.heidari@hotmail.com
2. Department of Knowledge and Information Science, Faculty of Management, University of Tehran, Tehran, Iran. E-mail: noruzi@ut.ac.ir
3. National Museum Institute (Noida Campus), A-19, Institutional Area, Sector-62 Noida - 201309, India. E-mail: peiduriisao@gmail.com

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ABSTRACT

Objective: The purpose of this study was to investigate the number of times the names of the top 1% authors in the field of library and information sciences were placed in the first position of authorship and to determine the level of their excellence index in 2022 based on the number of publications and previous authorship.

Methods: The present research has been done with the scientometrics approach. The statistical population of the study was the top 1% researchers in the field of library and information science (LIS) in 2022. The top 1% researchers include Vincent Larivière, Cassidy Sugimoto, Stefanie Haustein, Mike Thelwall, Nees Jan Van Eck, and Ludo Waltman and Margaret Sampson, from the Social Sciences. Each researcher's name was searched in the Web of Science Core of Clarivate to retrieve their articles, and the status of single authorship, multi-authorship, and the first and the last authorship was checked.

Results: The results of the present study showed that the top 1% researchers in LIS are more inclined to multiple authorship rather than single-authorship. They have mostly registered their names in the first and last positions of authorship. Considering the dominance of a researcher as a virtue of research contribution and responsibility, researchers should register their names in the order of authorship.

Conclusion: According to the dominance index (DI), the first place of authorship can show the dominance and superiority of researchers. The dominance index can be used as a complement to the citation impact of researchers and can be used to identify the top 1% LIS researchers.

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Introduction

The authorship position is an author's position among the co-authors in the by-line or ascription in a research publication. The following two positions among the list of co-authors are particularly important:

1. *First author*: It is commonly perceived that the first author is the researcher who had the idea for the underlying work, did the main body of work, and contributed substantially to the draft manuscript. Being the first author is a coveted position, which conveys increased visibility because it is the first name a reader sees. Furthermore, in certain contexts, for example, in-text citations or references, if there are three or more authors, only the first author's last name is cited followed by "et al.", meaning "and others".
2. *Last author*: this position is traditionally reserved for the supervisor, department head, or principal investigator. The last authors are accountable for the quality of the data and analysis reported in the publication. In many cases, the last author is also the corresponding author and the primary contact for journal editors (Definitive Healthcare, 2021).

The order of names of researchers in scientific publications is of great importance. Therefore, it is very important to study and analyze it from a social, moral, disciplinary, and intellectual property rights perspective. The most logical way is to arrange the names of researchers based on research contributions or contributor roles, which reduces authorship disputes and facilitates collaborations. The authorship order of academic publications follows several approaches. Peidu (2019) presented several practices used to decide the authors' order:

1. by the amount of contribution;
2. alphabetical order;
3. multiple first author or multiple last author;
4. by seniority or reverse seniority;
5. by raffling or lottery system; and
6. by negotiation or mutual understanding. (Fernandes, Costa, & Cortez, 2021).

Waltman (2012) concluded that the use of alphabetical authorship is most common in mathematics, economics (including finance), and high-energy physics. He also concluded that the use of alphabetical authorship is relatively more common in the case of publications with either a small or a large number of authors.

Endersby (1996) stated that "four-fifth of economists list authors alphabetically; only a third of psychologists do. Political scientists follow this pattern in almost two-thirds of joint articles, but sociologists predictably order authorship in only half." However, Clement (2014) stated that in several journals (including applied engineering science, chemistry, and biology journals) it is customary to place the name of the senior investigator, who might have done considerable work, as the last author. While, Huth (1986) argued that it is a common practice to place the name of

the person who made the maximum contribution as the first author, and the sequence of co-authors should represent progressively lesser contributions.

Moreover, the names of researchers with a more prominent and higher role in research are given priority in the authorship position. Therefore, the first and corresponding authors are of special interest and importance. The authorship order has become more important with the increasing trend of multi-authorship in recent decades. For example, in research, Chambers, Boath, and Chambers (2001) investigated all *BMJ* editorials and articles (papers, general practice, information in practice, clinical review, and education and debate) with two or more authors published from 1 August 2000 to 31 July 2001. They excluded authors placed fourth or later. For each article, they recorded the order of the authors according to the initial letter of their surname. They reviewed a total of 550 articles and editorials, with 1456 authors. They found that first authors were more common than second or third authors for nine of the 13 letters in the first half of the alphabet (A, E, F, G, H, I, J, L, M), but this applied to only two letters in the second half of the alphabet (P, Y). Although there was a high percentage of first authorships for those with surnames beginning with a Y, there were only seven authors in this category. These researchers concluded that if an author's name begins with Z, s/he will perish for sure. So, this could be a reason to change the researchers' last name! They believed that "Having a surname with an initial letter at the beginning rather than the end of the alphabet seems to be an advantage for order of authorship in papers in the *BMJ*. Academics could follow the precedent set by Larry Adler's grandfather and consider changing their surname to enhance their likelihood of first authorship." The results of this research reinforce the current debate on the meaning of the alphabetical order of authorship, rather than contributorship.

Ray and Robson (2018), in their paper entitled "*Certified random: A new order for coauthorship*" proposed a solution on their title page. The co-authors list their names in an unusual way: Debraj Ray ⓡ Arthur Robson. The symbol indicates that the order of their names is random. They introduced and studied certified random order, based on the assumptions that “the uniform randomization of names made universally known by a commonly understood symbol. Certified random order (a) distributes the gain from first authorship evenly over the alphabet, (b) allows either author to signal when contributions are extremely unequal, (c) will invade an environment where alphabetical order is dominant, (d) is robust to deviations, (e) may be ex-ante more efficient than alphabetical order, and (f) is no more complex than the existing alphabetical system modified by occasional reversal of name order.”

The International Committee of Medical Journal Editors Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (ICMJE, 2021) recommends that authorship be based on the following four criteria:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work;

- Drafting the work or revising it critically for important intellectual content;
- Final approval of the version to be published; and
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved (ICMJE, 2021).

Objective

The primary objective of the current study was to identify the status of authorship of "top 1%" researchers in the field of library and information science (LIS) in the first and the last positions assumed as two particularly important positions of authorship and to determine their level of dominance index (DI) based on the number of previous publications and authorship of each researcher.

It is worth noting that the assumption in this study was the *corresponding author* takes primary responsibility for *communication* and *correspondence* with a journal the authors choose to publish their manuscript in at that time. Thus, it is not considered as a writing position indicating the dominance. The *corresponding author* maybe placed in the first, second, third, fourth, or other positions. On this basis, it was not considered as an indicator to identify the dominant researchers.

Materials and methods

Based on the citations received, the top 1% researchers in the field of library and information science in 2022 were identified via the *Researcher Recognition* of Clarivate (https://clarivate.com/highly-cited-researchers/). Seven out of 270 Highly Cited Researchers in Social Sciences presented by Clarivate were in the field of library and information science (LIS). These highly cited researchers in LIS have demonstrated significant and broad influence reflected in their publication of multiple highly cited papers over the last decade (Clarivate, 2022).

The top 1% researchers included in the current research consist of Vincent Larivière, Cassidy Sugimoto, Stefanie Haustein, Mike Thelwall, Nees Jan van Eck, Ludo Waltman, and Margaret Sampson. Then, the name of each researcher was searched in the Web of Science Core Collection of Clarivate to retrieve their articles to examine the status of authorship (the status of multiple authorship and single-authorship research) in their articles on 20 December 2022. Finally, the dominance index (DI) of each researcher was calculated based on the number of previous publications and authorship of each researcher.

Dominance Index

Outstanding researchers would seek dominance both in terms of responsibility, crediting, and recognition, as they would when they conduct research solo (Peidu, 2019). However, several

studies show that multi-authorship has dominated over single-author in recent decades (Huth, 1986; Regaldo, 1995; Cozzarelli, 2004; Greene, 2007; Waltman, 2012).

In the authorship ordering of researchers, the first place indicates the degree of dominance and mastery. It makes sense when the ordering of researchers' names is determined based on scientific contribution and participation in the research.

In the current study, the Dominance Index's formula proposed by Peidu (2019) was accepted and further tested. For example, an author (A) has published (*M*) a number of multi-author papers. In this, assume that the author has (*F*) number of times as the first author. Then, the dominance index (DI) of the author is given as:

$$\mathrm{DI} = \frac{F}{M} \text{ or } \left(\mathrm{DI} = \frac{F}{M}100\right)$$

Results

Table 1 shows the single and multi-authorship status of the top 1% LIS researchers. The top 1% LIS researchers have mainly registered their names in the first and the last positions of authorship. Although it is not clear on what basis the names of the researchers are listed, perhaps their type of activity is such that their names are mostly placed in these two positions.

Table 1. Top 1% LIS researchers multiple-authorship

Researchers	Affiliation	No. of single author papers	No. of multi authorship papers	Total No. of papers
Stefanie Haustein	University of Ottawa,	5	53	58
Mike Thelwall	University of Wolverhampt	122	358	480
Cassidy Sugimoto	Indiana University Bloomington	8	149	157
Nees Jan van Eck	Leiden University	0	97	97
Ludo Waltman	Leiden University	8	112	120
Vincent Lariviere	University of Montreal	6	226	232
Margaret Sampson	University of Ottawa	2	163	165

Table 2 shows the Dominance Index of the top 1% LIS researchers. It also reveals to what extent each researcher was the first author. The majority of the top 1% LIS researchers have done most of their research in collaboration with other authors. This confirms the statement of Peidu (2019) that "*Gone are the days when research was done alone.*"

Table 2. Top 1% LIS researchers' dominance index

Researchers	No. of papers	No. of the first author position	No. of the last author position	No. of multi authorship papers	Dominance Index
Haustein	58	20	15	53	0.37
Thelwall	480	120	163	358	0.33
Sugimoto	157	26	58	149	0.17
van Eck	97	24	40	97	0.24
Waltman	120	46	48	112	0.41
Lariviere	232	36	121	227	0.15
Sampson	165	18	15	163	0.11

Discussion

The present study aimed to identify the status of authorship of "top 1%" LIS researchers in the first and the last positions assumed as two particularly important positions of authorship, and determined their level of dominance index (DI) based on the number of previous publications and authorship of each researcher in the first and the last positions. Therefore, the statistical population of this research was the top 1% LIS researchers in 2022, identified by the Web of Science Core Collection of Clarivate recognized over the last decade.

Examining the top 1% researchers in the category of social sciences, seven researchers were recognized as the top 1% in the field of library and information science. Then, considering all the publications of these researchers, we examined the number of single-author and multi-author publications and their writing position. The top 1% LIS researchers tend to write multi-author publications, and their position in the authorship was mostly in first and last position. This may be due to a variety of reasons, including respect and appreciation. According to the dominance index, the first place is more important and valuable and shows the superiority and ability (scientific skills, technical knowledge, etc.).

The dominance index can be an indicator to identify the top dominant researchers and can be used as a complement to the citation impact. Accordingly, the closer the score of the dominance index to one, the higher the possibility to be in the 1% dominant researchers. The dominance index of none of the LIS researchers was one. The highest dominance index was calculated for Ludo Waltman with a score of 0.41. Despite the large number of multi-authorship studies, the results of the current research suggest that authors should be more at the forefront of the authorship order. As a result, researchers should try to obtain the first position in the authorship order by emphasizing their role in research and improving their dominance index.

It is important to note that the dominance index is a measure in a scenario of multi-authorship. Another important factor that influences the score of the dominance index is the number of authors in a paper and the number of multi-authored papers a researcher has. The dominance index is irrelevant or may not have any bearing for an author who performs research solo. Peidu (2019) also discusses an alternative dominance index by the numbers of the relative position above or below in the authorship.

Previous studies (e.g., Chong & Park, 2018) examined the characteristics of the highly cited researchers (HCRs) in terms of their affiliated countries, institutions, and fields; while others examined the research collaboration pattern of the top 1% most cited scientists and showed an increasing collaboration and full-count publication rates for the top 1% most cited scientists (Nielsen & Andersen, 2021). These results supported and confirmed the findings of the current

study, in which the top 1% LIS researchers are more likely to engage in research collaboration and co-authored papers than single-authorship.

Conclusions

It can be concluded that in order to gain dominance and increase the score obtained from the dominance index, it is better for researchers to be in the first position of authorship. If the authorship position of the researchers in a study is based on the research contribution, researchers can do a large part of the study, highlight their role in advancing the research, and achieve the first author position. One of the factors that has a direct impact on the dominance index, in other words, makes the dominance index meaningful is the multi-authorship (research collaboration), involving researchers from different institutions and countries. For this purpose, it is better to promote the pattern of multiple authors and publish fewer articles as single authors.

The results of the present study showed that the top 1% LIS researchers are more inclined to the multiple-authorship pattern than single-authorship. They have mostly registered their names in the first and last positions of authorship. According to the dominance index, the first place of authorship can show the dominance and superiority of researchers. The dominance index can be used as a complement or substitute for the citation impact of researchers, and can be used to identify the top 1% researchers.

Author Contributions

Conceptualization, B.H. and A.N.; methodology, B.N.; software, B.N.; validation, B.H., A.N. and C.P.; formal analysis, B.H.; investigation, B.H.; resources, B.H.; data curation, B.H.; writing—original draft preparation, B.H.; writing—review and editing, A.N. and C.P.; visualization, B.N.; supervision, A.N.; project administration, A.N. All authors have read and agreed to the published version of the manuscript.

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Conflict of interest

The authors declare no conflict of interest.

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