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N. Zafrunnisha

JNTUA College of Engineering, Pulivendula, India

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Citation Analysis of PhD Theses in Psychology of Selected Universities in Andhra Pradesh, India

Dr. N. Zafrunnisha
Assistant Professor
JNTUA College of Engineering,
Pulivendula, India

Introduction

The exponential growth of scientific literature, interdisciplinary nature of research, and trend towards specialization have posed many problems both to the scientists and librarians. The extensive investigations and the abundance of literature being published and contributed to immense escalation of cost for the libraries, as the acquisition of published literature became an increasingly difficult task. To maintain a reasonable collection of periodicals, at least in broad fields, it is necessary for the librarians to know the characteristics of subject literature used by the users. Information is not only increasing exponentially but the growth rates also differ from one discipline to another.

The multiplicity of journals, the constraints of limited financial resources and the ever increasing needs of user community necessitated the librarians to develop need based information resources and services to meet the literature requirements of psychologists. Thus, a clear understanding of the characteristics of subject literature used by scientists is important for planning and designing of information system relating to a particular field.

Bibliometric techniques are used for a variety of purposes like determination of various scientific indicators, evaluation of scientific output, selection of journals for libraries and even forecasting potential Nobel Laurates. Bibliometric analysis has become a well established part of information research. The most obvious use of bibliometric data is to improve bibliographic control, as it is clearly not possible to provide efficient secondary services without knowing the size and characteristics of a literature. Bibliometrics has grown out of the realization that literature is growing and changing at a rate which no librarian or information worker equipped with traditional bibliographic methods and skills could keep abreast.

The popularity in the adoption of bibliometric techniques in various disciplines stimulated stupendous growth in literature on bibliometrics and its related areas.

The present research is undertaken to analyse the characteristics of literature used by researchers in the field of psychology as a whole and sub-fields of psychology. The present study will help the scientists and librarians in the selection of core

journals and other sources in psychology.

Objectives

The following are the objectives of the study

- To know the various sources of information consulted by the researchers in psychology;
- To observe the nature of authorship pattern in the literature of psychology;
- To examine the core journals of psychology;
- To trace the core book and journal publishers of psychology;
- To study the distribution of citations by subject, country of origin and language;
- To examine the applicability of Bradford's Law of scattering to the pattern of journals used by the researchers in psychology;
- To find the obsolescence of literature used; and
- To assess the availability of the cited journal articles and journals in the library of Sri Venkateswara University, Osmania University and Andhra University.

Hypotheses

- Journals are the mostly cited sources by the researchers in the field of Psychology.
- Researchers of Psychology prefer foreign journals rather than Indian journals.
- The half-life value of book citations is high compared to journal citations in Psychology.
- Collaborative authorship is high compared to single authorship in the period of study.
- Most of the cited journal literature in Psychology is published by developed countries.
- The literature of Psychology is found predominantly in English language
- The literature of Psychology is spread over a wide range of allied subjects.

Review of the Literature

Citations in Theses/Dissertations

Verma and Murthy (1971)¹ analysed the citations in the fields of Political Science and Economics. Jones and Chapman (1972)² studied the 'Characteristics of the literature' used by Historians. Liborie and Helperin (1976)³ studied the citation pattern in Library Science Dissertations. Devarajan and Vijayalakshmi (1982)⁴ analysed the citations cited in Applied Economics dissertations. Maheswarappa and Prakash (1982)⁵ studied the literature use pattern by the researchers in the field of botany. Two thousand, seven hundred and twenty six references from 15 doctoral dissertations were analyzed. The average rate of self-citation was found to be 3.22%. Half- life of botanical literature was 12 years.

Omuruy (1982)⁶ analysed the citations mentioned in social science dissertations. De Oliveria (1984)⁷ examined the citation pattern in Veterinary Medicine dissertations. Hemasundar Naidu (1984)⁸ analyzed the citation pattern in Poultry Science Dissertations. Kabir (1984)⁹ analysed the citations in the dissertations of Agricultural Sciences. Rajasree (1987)¹⁰ analysed the citation pattern in Ph.D theses accepted by Sri Venkateswara University in Botany.

Hiremath and Sangen (1988) carried-out a citation analysis of doctoral dissertations in Chemistry. Results revealed that more than 89% of citations were less than 29 years old, 11% of the citations pertain to English language journals and that 56% of the literature cited was from USA.

Srinivasulu (1993)¹² studied the citation pattern in the dissertations of Agronomy. Panda (1994)¹³ examined the effectiveness of library collection through citation analysis of doctoral dissertations in Political Science. Deo et al., (1995)¹⁴ analysed 4066 references cited to doctoral dissertations in English language and literature submitted to Dr. B.A. Marathwada University. Sessaiah (1996)¹⁵ analysed the citations in Ph.D theses of S.V.University in History.

Pandey and Rajyalakshmi (1997)¹⁶ made a study of 65 dissertations in Library and Information science submitted to Nagpur University during 1990-1994. Lainb and Goi (1997)¹⁷ have made citation analysis of 5610 references from 104 dissertations in Malaya University during 1984-1994. John (1997)¹⁸ analysed 1069 references from five Ph.D theses of psychology accepted by Kerala University from 1985-1990. Vijay Kumar (1997)¹⁹ analysed the citations in Ph.D theses in English literature accepted by S.V. University.

Vimala (1997)²⁰ studied the citation pattern in Ph.D theses in Biological Sciences' submitted for the award of doctoral degree to S.V. University. She analysed 39,453 citations appended to these theses. Ninety one percent of citations were published in English language. Country-wise distribution of citations in Biological sciences showed that the researchers in Biological sciences were heavily citing the literature published from USA, UK and India. These three countries contributed (80%) of total citations. Multi-authored papers contributed 73.33% of total citations. The degree of collaboration in biological sciences as a whole was 0.73 and the average number of authors per citation was 2.01. The journal, 'Plant Physiology', got the first rank. The first nine journals in the rank list contribute 25% of total citations. Age-wise distribution of citations in biological sciences showed that nearly 255 of journal citations were six or less than six years in age and 50% of the citations were 12 years or less than 12 years in age. Half-life of journal citations in Biological Sciences was found to be 11.43 years whereas it was 12.79 years for book citations. Half-life period is more for books compared to journals.

Birdar and Premalatha (1998)²¹ conducted a bibliometric study of Psychiatric (Alcoholism) literature cited in 14 MD psychiatric dissertations submitted to the Department of Psychiatry, NIMHANS, Bangalore, during the period, 1974-1995. Most of the citations (73.22%) are articles in periodicals. The other bibliographic forms are books (16.32%), reports (4.35%), seminar/conference proceedings (2.32%), manuals (0.94%) and other forms (1.8%).

Aruna Prasad Reddy (1999)²² analysed the citations appended to 186 doctoral dissertations in the field of Chemistry submitted to Sri Venkateswara University, Tirupati. The Bibliographic form-wise distribution of citations revealed that journal literature was the most referred source of information (85.03%), followed by books (10.44%), patents (1.25%), dissertations (1.12%) and others (2.18%). Researchers of Chemistry preferred documents published in the English language (73.86%), followed by Russian (4.44%), Japanese (1.46%), German (0.89%), French (0.79%) and Chinese (0.64%). The country-wise scattering of citations showed that USA alone covered 35.51% of total citations, followed by UK (17.91%), India (11.04%), Netherlands (6.11%), Germany (5.67%) and Russia (5.44%). The study of the authorship trend showed that papers with multi -authored were the highest in number (77.50%) and single authored papers constituted 22.50% of the total cited papers. The half-life period for journal citations was found to be 17.84 and 17.68 years for book citations.

Lee (2000)²³ examined the publication rate of successful Ph.D scholars in the

fields of Analytical chemistry, Experimental psychology and American literature. The results revealed that there was a decline in single authored papers in many fields. Bandopadhyay and Nandi (2001)²⁴ studied citation analysis of references used in doctoral dissertations of Political Science submitted to Burdwan University during the period 1991-1995.

Doraswamy and Pulla Reddy (2001)²⁵ in their study analysed 2471 citations appended to Geographical theses submitted to Sri Venkateswara University for the award of doctoral degree during the period 1991-2000. Books appeared to be the most preferred source of information contributing the highest number of citations (41.89%). Most of the citations (76.12%) are single authored papers. The articles are scattered in 154 different journals. The Journal, 'Geographical Review of India' got the first rank. The researchers in Geography mostly depended on the journals of their own subject i.e., (69.19%). Geographical researchers heavily cited Indian journals. The country-wise scatter of citations showed that India occupied first position with 32.41% of the total citations, followed by USA (8.63%) and UK (7.64%).

Harwade and Dankhade (2002)²⁶ investigated 23 doctoral theses in Economics submitted to Nagpur University during the period 1996-99. The bibliographic form-wise distribution of citations showed that books accounted for 42.77% of citations, followed by journals (32.81%), Ph.D theses (14.70%), newspapers (4.50%) and others (5.22%). The results revealed that the single authored papers were the highest in number. Half -life period for journals was found to be 22 years.

Omkar Murthy (2002)²⁷ conducted a bibliometric study of citations in Ph.D theses in Geography'. Most of the journal citations are from English language, followed by Telugu (0.24%), French (0.12%) and Spanish (0.05%). Ramesh (2002)²⁸ analysed 381 Ph.D dissertations submitted by research scholars to different Indian Universities during these fifty years i.e., 1951-2000.

Bandopadhyay (2003)²⁹ analysed 11,221 citations cited in 92 doctoral theses concerning to five different disciplines of science, namely, Mathematics, Physics, Mechanical Engineering, Political Science and Philosophy.

Chandra Kumar and Sriharan (2003)³⁰ examined the 'referencing pattern among the Sanskrit researchers. In this study, they analysed 1351 citations cited in 17 doctoral dissertations of Sanskrit submitted to University of Madras from the period 1993-2000. Birdar and Thippeswamy (2004)³¹ made an attempt to investigate 'information use pattern by Pediatricians. This study was based on 3401 citations appended to 61 pediatric dissertations submitted to the JJM Medical College, Dawanagere. Journals were the most preferred source of information compared to other bibliographic forms. Multi-authored papers were more in number compared to single authored papers.

Collection of Data

The present study is concerned with the analysis of citations appended to the doctoral theses accepted in the field of Psychology for the award of doctoral degrees by Sri Venkateswara University, Tirupati, Osmania University, Hyderabad and Andhra University, Visakhapattanam.

The scope of the study is limited to two major sub-fields of Psychology viz., Basic Psychology and Applied Psychology.

One hundred and forty one Ph.D theses are available in the University libraries of Sri Venkateswara University, Tirupati, Osmania University, Hyderabad and Andhra University, Visakhapattanam. A total of 22,565 citations, appended to these theses form the basis for the study.

The information relating to each citation i.e., number of authors, bibliographic form, name of the journal, subject, country of origin, language, name of the publisher and the availability of references in the library concerned. If the citations are from a journal, the information regarding the country, language and the subject of the journal are obtained from 'Ulrich's International Periodicals Directory' and recorded on the reference cards of standard size of 12.5 X 7.5 cm. The data is fed into the computer using MS-Excel software and the Statistical Package for Social Sciences (SPSS) for analysis.

Findings

Distribution of Citations

The analysis of citations according to the bibliographic forms reveals that the journal literature is the most preferred source of information compared to other sources for the psychologists. Books, dissertations and theses secured second and third places respectively. Similar results are also noticed in the fields of Basic and Applied Psychology.

The language-wise analysis of citations in psychology reveals that the researchers in psychology are most dependent on literature published in English languages compared to other languages. Nearly 99.60% of citations are from documents published in English language. More or less similar results are found in the fields of Basic Psychology and Applied Psychology.

Country-wise analysis of citations in Psychology demonstrates that the researchers in Psychology are heavily cited the literature published from USA, UK and India. These three countries contribute more than 97% of total citations. More or less similar results are found in the fields of Basic Psychology and Applied Psychology.

Most of the cited literature is from Psychology (70.6%). Remaining 29.4% of the citations are from other related subjects like Medical Sciences, Education, Sociology, Management, Social Work, Social Sciences, Human Relations, Business and Economics, Home Science, Gerontology, Public Administration etc.

Authorship Patterns and Collaborative Research

Analysis of citations in Psychology and its sub-fields, in relation to the number of authors, reveals a more or less similar authorship pattern. The multi-authored papers are more in number (52.87%) and single authored papers are 48.13% of total journal citations. The number of collaborative papers indicates that the collaborative nature of research is growing. The average number of authors per article in Psychology as a whole is 1.67 and the corresponding figures for Basic Psychology and Applied Psychology are 1.77 and 1.63. The degree of collaboration (calculated using the formula given by Subramanyam) in Psychology as a whole is 0.53. The corresponding figures for Basic Psychology and Applied Psychology are 0.59 and 0.51.

The four regression models have been used to examine the suitability of the model that explains the trend in the single authorship pattern.

Model 1 : $y = a + bx$

Model 2: $y = a + bx + cx^2$

Model 3: $\text{Log } y = a + bx$

Model 4: $\text{Log } y = a + bx + cx^2$

The four regression models fit well to the data of the proportion of single

authorship in Psychology and the three regression models fit well in Applied Psychology. In the case of Basic Psychology among the four models, no single model can fit the data of single authorship.

Ranking and Scattering of Journals

The rank list of journals in the field of Psychology reveals that journal citations cited by researchers are scattered among 421 journals. Among them, 'Journal of Applied psychology' secured the first rank for being cited more number of times with 3.97% of total journal citations, followed by 'Dissertation Abstracts International' (3.71%) and 'Journal of Personality and Social psychology'(2.78%). The first 10 journals in the rank list contribute nearly 25% of total journal citations. The first 33 journals in the rank list contribute nearly 50% of total journal citations. These 33 journals can be considered as mostly used journals by the researchers. It is also obvious from the table that 75% of total citations are contributed by the first 87 journals in the rank list. The remaining 25% of citations are scattered among 334 journals.

The researchers in Basic Psychology have cited a total of 332 journals. Among them, 'Dissertation Abstracts International' secured the first rank for being cited more number of times with 4.1% of total journal citations, followed by 'Child Development' (3.61%) and 'Journal of Experimental Psychology' (2.78%). The first 10 journals in the rank list covered more than 25% of total journal citations. The first 29 journals covered nearly 50% of total journal citations. The first 76 journals cover 75% of total journal citations. The remaining 25% of citations are scattered among 256 journals.

The cited journal literature in Applied Psychology is scattered over 397 journals. Among them, 'Journal of Applied Psychology' secured the first rank for being cited more number of times with 4.68% of total journal citations, followed by 'Dissertation Abstracts International' (3.53%) and 'Journal of Personality and Social Psychology'(3.01%). The first 10 journals cover more than 25% of total journal citations. The first 32 journals cover more than 50% of total journal citations. The first 84 journals cover 75% of total journal citations. The remaining 25% of journal citations are scattered among 313 other journals.

The researchers of Sri Venkateswara University in Psychology have cited 315 journals. Among them, the 'Dissertation Abstracts International' occupies the first place for being cited more number of times with 4.26% of total journal citations, followed by 'Journal of Gerontology' (4.15%) and 'Journal of Applied Psychology' (4.02%). The first 7 journals cover nearly 25% of the total journal citations.

The researchers of Sri Venkateswara University in Basic Psychology have cited 206 journals. Among them, 'Journal of Experimental Psychology' occupies the first place for being cited more number of times with 5.46% of total journal citations, followed by 'Psychological Abstracts'(4.63%) and 'Dissertation Abstracts International' (4.20%). The first 7 journals cover more than 26% of total cited journals.

The researchers of Sri Venkateswara University in Applied Psychology have cited 286 journals. Among them, 'Journal of Gerontology' got the first rank for being cited more number of times with 4.70% of the journal citations, followed by 'Journal of Applied Psychology'(4.21%) and 'Dissertation Abstracts International' (3.93%). The first 8 journals in the rank list cover more than 25% of the total journal citations.

The researchers of Osmania University in Psychology cited a total of 310 journals. Among them, 'Dissertation Abstracts International' got the first rank for being cited more number of times with 4% of the total journal citations, followed by 'Child Development' (3.85%) and 'Journal of Applied Psychology' (3.33%). The first 7 journals in the rank list cover nearly 26% of the total journal citations.

The researchers of Osmania University in Basic Psychology cited a total of 206 journals. Among them, 'Child Development' got the first rank for being cited more number of times with 5.58% of total journal citations, followed by 'American Journal of Mental Deficiency' (4.28%) and 'Journal of Speech and Hearing Disorders' (13.40%). The first 7 journals cover nearly 25% of total journal citation.

The researchers of Osmania University in Applied Psychology cited a total of 284 journals. Among them, 'Dissertation Abstracts International' got the first rank for being cited more number of times with 4.32% of total journal citations, followed by 'Journal of Applied Psychology' (4.16%) and 'Journal of Personality and Social Psychology' (3.13%). The first 9 journals in the rank list cover nearly 25% of total journal citations.

The researchers of Andhra University in Psychology cited a total of 310 journals. Among them, 'Journal of Applied Psychology' got the first rank for being cited more number of times with 5.09%, followed by 'Academy of Management Journal' (3.35%) and, 'Journal of Organizational Behaviour and Human Performance' (3.24%). The first 9 journals in the rank list cover more than 25% of total journal citations.

The researchers of Andhra University in Basic Psychology cited a total of 177 journals. Among them, 'Dissertation Abstracts International' got the first rank for being cited more number of times with 5% of total journal citations, followed by 'Educational Research' (3.25%) and 'Educational and Psychological Review' (2.77%). The first 9 journals in the rank list cover more than 25% of total journal citations.

The researchers of Andhra University in Applied Psychology cited a total of 269 journals. Among them, 'Journal of Applied Psychology' occupies the first rank for being cited more number of times with 6.01%, followed by 'Academy of Management Journal' (4.41%) and 'Journal of Organizational Behaviour and Human Performance' (3.99%). The first 7 journals in the rank list cover nearly 25% of total journal citations..

The data has been used to test Bradford's Law of scattering and the Bradford's bibliograph for the journal citations in Psychology and its sub-disciplines viz., Basic Psychology and Applied Psychology. The verbal formulation of Bradford's Law is also applied and it is found that the literature use pattern by Psychologists does not fit the Bradford's Law of scattering. Similar results are found in the fields of Basic and Applied Psychology. The non-applicability of Bradford's Law, when applied to the scattering of journal literature in Psychology as a whole and its sub-fields Basic and Applied Psychology, may be due to the heavy concentration of citations in a few journals.

The basis for choosing the three zones is that the variation is found to be minimum among the number of citations in each zone. Seventeen journals are the most productive journals devoted to Psychology sharing 4.03% of total citations.

The next zone is represented by 46 journals, which share 10.92% of total cited journals and the last zone is represented by 358 journals which share 85.04% of total cited journals. Hence, the journal distribution as per Bradford's zone in Psychology is in the ratio of 17: 46: 358.

The ratio of the number of journal titles in the three zones in Basic psychology is 16: 40: 276 and in Applied Psychology it is 15: 46: 336. It is observed from the above ratios that the number of journal titles in each zone is not increasing geometrically. Hence, it is established that the journal usage pattern in the discipline of Psychology and its sub-fields does not satisfy the verbal formulation of Bradford's Law of scattering. This may be due to the heavy concentration of citations in a few journals.

The distribution of cited journals in Psychology and its sub-disciplines according to

their country of origin reveals that most of the journals are published from USA, UK and India. These three countries contributed nearly 73% of the total cited journals. More or less similar results are found in the sub-disciplines of Psychology namely Basic and Applied Psychology. It is found that most of the cited journals (93.75%) are published in English language. The remaining cited journals are from other languages like French, German, Czech, Japanese etc. Similar results are found in the sub-fields of Basic and Applied Psychology.

Obsolescence of Literature

The Obsolescence of Literature in Psychology discloses that nearly 27% of journal citations are 8 years old or less than eight years in age, 50% of citations are 14 years old and 75% of journal citations are 22 years old or less in age. More or less similar trend is observed with respect to the distribution of cited literature in the sub-fields of Psychology.

The results of K-S test confirmed statistically that the obsolescence (distribution) rate of journal and book citations followed a negative exponential distribution.

Half-life of journal citations in Psychology is found to be 14 years whereas it is 19 years for book citations. Half-life of Basic Psychology is found to be 13 years for journals and 18 years for books. In Applied Psychology, it is found to be 14 years for journals and 19 years for books.

Availability of Journal Literature

The researchers in Psychology of Sri Venkateswara University have cited 6594 journal citations. Out of them 60% are available in Sri Venkateswara University library, Tirupati. The researchers in Psychology of Osmania University have cited 4401 journal citations. Out of them 62.62% are available in Osmania University library, Hyderabad. The researchers in Psychology of Andhra University have cited 3379 journal citations. Out of them 72.83% are available in Andhra University library, Visakhapatnam.

That means libraries of Sri Venkateswara University, Osmania University and Andhra University are meeting most of the requirements of researchers in Psychology.

Testing of Hypotheses

Hypotheses number one states that: Journals are the mostly cited sources by the researchers in the field of Psychology. This was put to test and it is found to be true. It is evident from Table 4.1 that the journals contribute the highest number of citations.

The second hypothesis states that: Researchers of Psychology prefer foreign journals rather than Indian journals. This was put to test and it is found to be true. It is evident from Table 4.23 that most of the journals cited by the researchers of Psychology are foreign journals.

The third hypothesis states that: The half-life value of book citations is high compared to journal citations in Psychology. This was put to test and it is found to be true. It is evident from Table 4.48 that the half-life value of book citations is high compared to journal citations.

The fourth hypothesis states that: Collaborative authorship is high compared to single authorship in the period of study. This was put to test and it is found to be true. It is evident from Table 4.13 that the collaborative authorship is high compared to single authorship.

The fifth hypothesis states that: The cited journal literature in Psychology is published by developed countries. This was put to test and it is found to be true. It is evident from Table 4.42 that most of the journal literature is published by developed countries.

The sixth hypothesis states that: The literature of Psychology is found predominantly in English language. This was put to test and it is found to be true. It is evident from Table 4.4 that most of the literature of Psychology is published predominantly in English language.

The seventh hypothesis states that: The literature of Psychology is spread over a wide range of allied subjects. This was put to test and it is found to be true. It is evident from Table 4.10 that the Psychology literature was published in a wide range of subjects.

The present investigation is based on the citations cited in Ph.D theses in Psychology accepted by Sri Venkateswara University, Tirupati, Osmania University, Hyderabad and Andhra University, Visakhapattanam. Similar type of investigations can be carried out covering the theses in Psychology from other Universities also, so as to generalize the findings of the study and gain an in-depth knowledge of the characteristics of the literature used by the researchers in the field of Psychology.

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