Authorship pattern and degree of collaboration in psychology

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Studies related to authorship trend and collaborative researches are considered as an important facet of modern science. The paper presents a study of the authorship pattern and collaborative research in the field of Psychology. The required data collected from 141 Ph. D theses submitted to three universities during the period 1963 – 2003 are used as source material for the present investigation. The collected data included 22,565 citations, among these only journal citations are consider for the study, which were appended to the 141 theses. A total 14374 journal citations came out and were utilized for the present investigation. Predominance of multi-authored papers over single authored papers is seen. The degree of collaboration in Psychology is 0.53. USA defences first by producing 42.28% of cited journals. Majority of the cited journals of Psychology (94.54%) are in English language.

Introduction

The study of authorship pattern and productivity is an important factor in citation analysis. Generally, authorship of a paper or document has become important for scientists and researchers. In order to make out the author productivity and authorship pattern, the analysis of the nature of research collaboration in research activity is primary factor. Collaborative research activity is a well recognized feature of modern science, and there has been a consistent trend towards increased collaboration in all branches of science during the present century.

Price1 on the basis of survey of Chemical Abstracts, observed a steady trend towards multiple authorship and thereby holding that if it continues at the present rate, by 1980 the single author papers will be extinct. Though the above postulation may not hold true, a decline in the number of scientific papers published by single authors is evident. Fox and Feaver2 are of the view that the increase in the number of multi authored papers may be due to the collaboration of specialists leading to enhanced quality of research. The reasons for collaborative research can be attributed to the interdisciplinary nature of investigations, escalating cost of instrumentation and laboratory facilities and interest of scientists in the same subject fields. Degree of collaboration in respect of a discipline in an organization is the ratio of multi-authored papers published during a year and the total number of papers published during the year.

Scope and objectives

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, among them 14,374 journal citations are identified and these form the basis for the study.

The specific objectives of the present study are to determine the:

- Nature of authorship pattern in the literature of psychology, basic psychology and applied psychology,
- Proportion of single Vs multi-authored papers in psychology, basic psychology and applied psychology,
- Degree of collaboration in psychology, basic psychology and applied psychology,
- Country wise distribution of journals in psychology, and
- Language wise distribution of journals in Psychology.
Methodology
The present study is concerned with the analysis of journal 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, Visakhapatnam. The information relating to each citation, i.e., number of authors, bibliographic form, name of the journal, subject, country of origin, language are recorded. The journal 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.

Results and discussion
The present study elucidates the authorship pattern and degree of collaboration in journal citations in the field of Psychology as a whole and sub-fields of Basic and Applied Psychology.

It is evident from Table 1 that the single authored papers are maximum with 47.12% of the total journal citations, multi-authored papers accounting for 52.87% of the total cited papers in Psychology. It is observed from Table 1 that single authored papers have shown declining trend from 75.56% (1926-1935) to 23.81% (1996-2005). As a result of which, the multi-authored papers have increased from 24.44% to 76.19%. This result is in accordance with the findings of Balog (1979), Mendenhall and Higbee (1982), Gladding (1984), Mahapatra and Mathias (1987), Karisiddappa, Maheswarappa and Shirol (1990), Norris (1993), Nagarajan (1995), Udofia (2002), Krishna and Kumar (2004) and Kannapanwar et al., (2004), Birdar and Premalatha (1998), Omkaramurthy (2006), Nattar (2009), Smith (1958), White and White (1977), Mendenhall and Kenneth (1982), Wendy, Herrod and Jef (2006), Ying, Schubert and Gobinda (1998), Anthony et al (2003), James and Lisa (2003) and Sangam (2003).

Authorship pattern in Basic Psychology is also shown in Table 1. It is evident from the table that the single authored papers are maximum with 53.58% of total
citations, multi authored papers account for 46.37% of total cited papers. It is noticed from Table 2 that in Basic Psychology single authored papers have shown a declining trend from 79.4% (1941-1945) to 26.8% (1996-2000).

Authorship pattern in Applied Psychology shows that single authored papers account for 44.18%, and multi-authored papers account for 55.81% of the total journal citations. This indicates a trend forwards collaborative research in the field of Applied Psychology.

**Single Vs multiple authorship**

Table 2 presents the predominance of multi-authored papers over single authored papers. The multi-authored papers account for more than 52% in Psychology as a whole. The percentage of multi-authored papers in Applied Psychology is 55.82%. In the case of Basic Psychology the single authored papers are more compared to multi-authored papers as shown in the table.

**Degree of collaboration and average number of authors per citation**

The extent of collaboration in research can be measured with the help of multi authored papers using the formula given by Subramanyam (1982)²:

\[
\text{Degree of collaboration } C = \frac{Nm}{Nm + Ns}
\]

Where:
- \( C \) = Degree of collaboration
- \( Nm \) = Number of Multiple authors
- \( Ns \) = Number of Single authors

The degree of collaboration in the field of Psychology as a whole is 0.53 and its sub-disciplines, i.e., Basic Psychology 0.59 and Applied Psychology 0.51 for various years have been computed and presented in Tables 5, 6 and 7 respectively.

It is observed from Table 3 that the degree of collaboration in Psychology has been increasing from the period 1936-1945 to 1996-2005. This indicates the
trend towards collaborative research. The average number of authors per paper has decreased from 1.48 (Till 1925) to 1.32 (1926-1935). After that it increased from 1.36 (1936-1945) to 2.46 (1996-2005). This supports the prediction of Price 25 that team research is a common trend in scientific research. Same trend is seen in Basic and Applied Psychology as well.

It is evident from Table 4 that the degree of collaboration in Basic Psychology has decreased from the period 1925 to 1926-1945 then increased from the period 1946-1955 and again it has decreased. The table clearly shows the changing research trend. The average number of authors per citation is 1.77 in Basic Psychology.

It is obvious from Table 5 that the degree of collaboration in Applied Psychology has increased from the period 1936-1945 to 1956-1965 and has decreased from the period 1966-1975. Again is increased from 1926-2005. This indicates the trend towards collaborative research. The average number of authors per citation in Applied Psychology is 1.63.
Table 5 — Degree of collaboration in applied psychology

<table>
<thead>
<tr>
<th>Year</th>
<th>Total no. of citations</th>
<th>Total no. of Authors</th>
<th>Average no. of authors per citation</th>
<th>No. of single authored papers</th>
<th>No. of multi-authored papers</th>
<th>Degree of collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Till 1925</td>
<td>65</td>
<td>97</td>
<td>1.49</td>
<td>41</td>
<td>24</td>
<td>0.36</td>
</tr>
<tr>
<td>1926-1935</td>
<td>205</td>
<td>270</td>
<td>1.31</td>
<td>154</td>
<td>51</td>
<td>0.25</td>
</tr>
<tr>
<td>1936-1945</td>
<td>406</td>
<td>470</td>
<td>1.15</td>
<td>270</td>
<td>136</td>
<td>0.33</td>
</tr>
<tr>
<td>1946-1955</td>
<td>696</td>
<td>1026</td>
<td>1.47</td>
<td>403</td>
<td>293</td>
<td>0.42</td>
</tr>
<tr>
<td>1956-1965</td>
<td>1590</td>
<td>2604</td>
<td>1.64</td>
<td>892</td>
<td>698</td>
<td>0.44</td>
</tr>
<tr>
<td>1966-1975</td>
<td>2110</td>
<td>3716</td>
<td>1.76</td>
<td>1323</td>
<td>787</td>
<td>0.37</td>
</tr>
<tr>
<td>1980-1985</td>
<td>2735</td>
<td>4100</td>
<td>1.49</td>
<td>1090</td>
<td>1645</td>
<td>0.60</td>
</tr>
<tr>
<td>1986-1995</td>
<td>1657</td>
<td>2990</td>
<td>1.80</td>
<td>556</td>
<td>1101</td>
<td>0.66</td>
</tr>
<tr>
<td>1996-2005</td>
<td>418</td>
<td>844</td>
<td>2.00</td>
<td>103</td>
<td>315</td>
<td>0.75</td>
</tr>
<tr>
<td>Total</td>
<td>9882</td>
<td>16117</td>
<td>1.63</td>
<td>4832</td>
<td>5050</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Table 6 — Language-wise distribution of journals in psychology

<table>
<thead>
<tr>
<th>Sl. no</th>
<th>Country</th>
<th>No. of journals</th>
<th>Percentage</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No. of Journal</td>
</tr>
<tr>
<td>1.</td>
<td>English</td>
<td>398</td>
<td>94.54</td>
<td>398</td>
</tr>
<tr>
<td>2.</td>
<td>French</td>
<td>2</td>
<td>0.48</td>
<td>400</td>
</tr>
<tr>
<td>3.</td>
<td>German</td>
<td>2</td>
<td>0.48</td>
<td>402</td>
</tr>
<tr>
<td>4.</td>
<td>Czech</td>
<td>2</td>
<td>0.48</td>
<td>404</td>
</tr>
<tr>
<td>5.</td>
<td>Japanese</td>
<td>2</td>
<td>0.48</td>
<td>406</td>
</tr>
<tr>
<td>6.</td>
<td>Hindi</td>
<td>2</td>
<td>0.48</td>
<td>408</td>
</tr>
<tr>
<td>7.</td>
<td>Sanskrit</td>
<td>1</td>
<td>0.24</td>
<td>409</td>
</tr>
<tr>
<td>8.</td>
<td>Bilingual</td>
<td>3</td>
<td>0.71</td>
<td>412</td>
</tr>
<tr>
<td>9.</td>
<td>Multilingual</td>
<td>3</td>
<td>0.71</td>
<td>415</td>
</tr>
<tr>
<td>10.</td>
<td>Un-identified</td>
<td>6</td>
<td>1.43</td>
<td>421</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>421</td>
<td>100</td>
<td>421</td>
</tr>
</tbody>
</table>

Language-wise distribution of journals

One of the main characteristics of science is its international nature. Due to this, the results of research are published in more number of languages. The languages of the cited journals are traced out from ‘Ulrich’s International Periodicals Directory’.

The Psychology researchers have cited a total of 421 journals. It is observed from Table 6 that the most of the cited journals of Psychology (94.54%) are in English language. Bilingual and Multilingual journals constitute (0.71%) and (0.71%) of the total cited journals respectively. The remaining journals are published in Czech (0.48%), Japanese (0.48%), Hindi (0.48%), French (0.48%), German (0.48%), and Sanskrit (0.24%).

Country-wise distribution of journals

Due to the international characteristics of scientific research, scientific literature is being published in almost all the countries of the world. In this section, all the cited journals are categorized according to their country of origin to find out the most productive countries in the literature of Psychology. The country of origin of the cited journals are traced out from ‘Ulrich’s International Periodicals Directory’.
Table 7 presents the country-wise distribution of cited journals in Psychology. As revealed by many previous citation analysis studies, it is a well known fact that USA and UK are the main producers of journals. It is observed from the Table 7 that USA ranks first by producing 42.28% of cited journals. India got second rank with 21.38% of total cited journals, followed by UK (15.44%) and Canada (1.75%). The above four countries produced nearly 75% of cited journals. The remaining 25% of journals are from 26 countries. It is noticed from the table that USA journals are mostly cited compared to the journals from other countries.

### Findings

1. Analysis of citations in Psychology and its sub-fields, in relation to the number of authors, reveals a more or less similar authorship pattern.

2. The multi-authored papers are more in number (52.87%) and single authored papers are 48.13% of total journal citations.

3. The number of collaborative papers indicates that the collaborative nature of research is growing.

4. 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.

5. 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.

6. USA ranks first by producing 42.28% of cited journals.

7. Most of the cited journals of Psychology (94.54%) are in English language.

### Conclusion

This study demonstrates the degree of author collaboration in the literature of Psychology. In particular, this study reveals a perceptible upward trend of collaborative Psychology research with the results of
these research efforts being reported in all major core Psychology journals. It is concluded that this study indicates towards Collaborative research. The number of collaborative papers indicates that the collaborative nature of research is growing. It can be concluded that the results of this type of study would be appeared to be of great potential in the management of library journal collection. The reasons for collaborative research can be attributed to the interdisciplinary nature of investigations, escalating cost of instrumentation and laboratory facilities and interest of scientists in the same subject fields.

References