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A Preliminary Study on the Survival Status of Chinese Open Access Journals: A Crisp-Set Qualitative Comparative Analysis (csQCA) of Postprints

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Abstract

In the Internet era, open access as a novel publishing model facilitates the free circulation of academic ideas. The influence of open access journals has long been questioned by the academic community. Drawing upon the DOAJ and WOS databases, this study employs crisp-set qualitative comparative analysis (fsQCA 3.0 software) to investigate open access journals. Diverging from traditional speculative and observational approaches, it explores the necessary and sufficient conditions for the survival and development of domestic Chinese open access journals, uncovers potential pathways, and provides insights for the future survival and development of open access journals.

Full Text

Preamble

A Preliminary Study on the Survival Status of Chinese Open Access Journals: Based on Crisp-set Qualitative Comparative Analysis (csQCA)

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Abstract: In the Internet era, open access has emerged as a new publishing model enabling the free circulation of academic ideas. However, the impact of open access journals has long been questioned by the academic community.

Drawing on the DOAJ and WOS databases, this study employs crisp-set qualitative comparative analysis (using fsQCA 3.0 software) to investigate open access journals. Moving beyond traditional speculative and observational methods, we explore the necessary and sufficient conditions for the survival and development of indigenous Chinese open access journals, identifying potential pathways to inform future development strategies.

Keywords: Internet era; qualitative comparative analysis; open access; journal impact; data analysis
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The free circulation of academic ideas through open access journals has drawn considerable attention regarding their impact. This study breaks from conventional observational and speculative approaches by attempting to identify core conditions affecting open access journal impact through qualitative comparative analysis, thereby providing insights for future improvements. The paper is organized into five sections: a review of open access journal quality research, the suitability of qualitative comparative analysis, research design and data analysis, and final reflections.

1. Review of Open Access Journal Quality Research

Open Access (OA) represents a novel form of academic publishing in the Internet era, enabling free circulation of scholarly resources online and facilitating academic sharing and exchange. Open Access Journals help break the current academic deadlock by challenging the monopoly of large academic publishing conglomerates. As the number of OA journals grows, identifying high-quality open access journals to promote healthy academic development has become an urgent priority for the academic community.

Current research on open access journal quality predominantly employs quantitative methods and focuses on top-tier foreign journals. Therefore, it is necessary to shift our research focus to domestic open access journals, investigating the factors behind their success and failure to better guide the development of China' s open access journal ecosystem.

2. Introducing Qualitative Comparative Analysis (QCA) to Journal Evaluation

Qualitative Comparative Analysis (QCA) emerged during the early 20th-century paradigm shift in Western mainstream research and has been widely applied in political science, economics, and sociology. QCA integrates and transcends traditional quantitative and qualitative research by combining their strengths to establish a "middle path."It pursues asymmetric causal relationships rather than the symmetric correlations sought by quantitative research, exploring causality while retaining case-specific characteristics. Compared to qualitative research, QCA offers greater objectivity by examining what conditions exist within the complex structures of cases, how these conditions interact, and how they ultimately achieve certain outcomes. This study attempts to introduce this research method to open access journal quality evaluation.

Under this framework, we can view the development status of Chinese open access journals as a set, with different reasons or conditions leading to journal survival or demise as its subsets. This study adopts a causal subset relationship, which involves multiple combinatorial pathways. For example, for the outcome "low academic impact of open access journals," possible causal paths might include the open access publishing model itself as a sufficient condition, though other reasons may also contribute to low impact. Importantly, such causal relationships are asymmetric, unlike the symmetric causal relationships in traditional quantitative research.

Based on this approach, we can utilize the open access journal communication process model to identify conditions related to open access journal impact. The open access journal communication process model [1] was proposed by scholar Zhou Jinping in the book *Research on the Academic Impact of Open Access Journals*, detailed as follows:

[Figure 1: see original paper] Open Access Journal Academic Communication Process Model

From this model, we can extract three dimensions of factors affecting open access journal impact: authors, readers, and the journals themselves. The conceptualization and operationalization of these three dimensions will be described in detail in the research design section.

3. Analysis of Key Factors in Open Access Journal Academic Impact

The academic impact of open access journals is primarily constrained by three factors: authors, readers, and the journals themselves.

In terms of author impact, three main factors emerge: co-authorship, nationality, and previous publications. Smart and Bayer' s 1986 study demonstrated that multi-authored papers indeed have greater impact advantages, as they com-

bine each author' s strengths and academic networks, making it easier for other scholars within those networks to cite the paper [2]. Greenwald and Shuh' s 1994 research showed that most researchers worldwide tend to prioritize citing papers by American authors, reflecting the dominant position of Western countries, particularly the United States, in the scientific field [3]. Petty' s research indicates that authors with extensive publication records are more likely to receive positive evaluations from readers and editors, though this high-quality output group also monopolizes relatively superior academic resources [4].

Regarding reader impact, reading data serves as a crucial indicator, including download counts, readership, citation rates, and access statistics, which vary across different OA platforms based on their front-end data.

Finally, each open access journal possesses diverse characteristics regarding impact factor, reputation, publication cycle, H-index, language, database indexing, editorial policies, rejection rates, and peer review processes. Operationally, these can be decomposed into whether the journal is indexed in WOS or CNKI, what languages it accepts for submissions, and whether it maintains rigorous peer review. For comparison purposes, it is best to select journals within the same research field.

4. Research Design and Data Analysis

4.1.1 Author Variables

We examine two dimensions: co-authorship and nationality. If all articles in a journal have two or more authors, it is coded as 1; otherwise, it is coded as 0. If co-authors include researchers from developed countries in Europe or America, it is coded as 1; otherwise, it is coded as 0.

4.1.2 Reader Variables

Based on Web of Science data from 2019, we calculate two metrics: citation frequency and browsing frequency. If the average citation count per article published in 2019 exceeds 5, it is coded as 1; otherwise, 0. If the average browsing count per article published in 2019 exceeds 5, it is coded as 1; otherwise, 0.

4.1.3 Journal Variables

Journals are assessed across three dimensions: language, sponsoring institution, and article processing charges (APCs). Since only one of the 29 journals accepts Chinese submissions only, this condition lacks discriminant power and is therefore removed. The sponsoring institution' s academic influence is evaluated: academic organizations such as universities and associations are coded as 1, while commercial publishers are coded as 0. Journals that charge APCs are coded as 1, while those offering free publication are coded as 0.

4.2 Outcome Variable

Journals still being updated are considered surviving and coded as 1. Journals that ceased updating after January 1, 2020, are considered defunct and coded as 0.

4.3 Data Processing

Based on the above considerations, to study the impact of Chinese open access journals, we selected 167 journals published by Chinese institutions indexed in the Directory of Open Access Journals (DOAJ). To control for research field effects, we filtered for 29 journals categorized under "Technology" and indexed in Web of Science. For objectivity and fairness, we used data from the entire year of 2019 (retrieved on January 3, 2021), detailed in Table 1 .

Table 1 Summary of Research Cases

First, assignment rules were developed based on the statistical distribution of condition and outcome variables, as detailed in Table 2 .

Table 2 Variable Assignment Rules

The truth table was then imported into the fsQCA 3.0 open-source software for computation. After further simplification, the Boolean-minimized truth table was obtained, as shown in Table 3 .

Table 3 Truth Table Simplified by fsQCA

During the computation stage, single-condition necessity analysis was conducted first, with results shown in Table 4 .

Table 4 Analysis of Single-Condition Necessity

As shown in the table above, for journal survival (outcome variable = 1), the consistency of the co-authorship condition is 1.0, greater than 0.9, indicating a necessary condition. For journal death or demise (outcome variable = 0), the consistency of browsing frequency and indexing status are both 0.909091, greater than 0.9, indicating that these two conditions are necessary but insufficient for journal death.

Subsequently, three solutions were obtained through Boolean algebra computation: complex, intermediate, and parsimonious solutions. We selected the intermediate solution for analysis.

4.4 Results Analysis

[Figure 2: see original paper] Analysis of Journal Survival Conditions

[Figure 3: see original paper] Analysis of Journal Death Conditions

The analysis reveals eight explanatory paths for journal survival and four for journal death. The consistency level for journal survival is 1, meeting the mini-

mum requirement of 0.75. Configuration S4 covers 16.7% of cases, with greater explanatory power than the other seven configurations, and predominantly features co-authorship as a necessary condition. The consistency level for journal death is also 1, meeting the minimum threshold. Configurations S1, S2, and S3 each cover 18.2% of cases, with higher explanatory power than S4, with low browsing frequency and indexing in multiple databases serving as necessary conditions.

4.5 Research on Journal Survival Patterns

For Chinese open access journals to survive in the market, they must meet the following conditions: articles must be co-authored by multiple researchers, exhibit low citation but high browsing frequencies, be sponsored by research institutions with strong academic influence, and adopt a zero-APC model.

Multi-author collaboration has become the prevailing trend for Chinese open access journals—among all 2019 publications in the 29 selected journals, only two articles were single-authored. The generally low citation frequencies indicate that the domestic and international academic impact of Chinese open access journals needs improvement. In China' s environment of scarce academic resources and funding, open access publication fees deter numerous researchers. Journals that charge no APCs while maintaining high-quality peer review represent a favorable measure to prevent the outflow of domestic academic resources, as such journals can sustain operations through advertising and other means.

We believe the most critical conditions are indexing in multiple databases, sponsorship by research institutions, and the zero-APC model. Encouraging universities to establish open access journals represents a new development approach that can both address graduate students' and young faculty' s publishing needs and enhance academic standards while building new types of think tanks.

4.6 Analysis of Open Access Journal Demise Factors

Examining configurations S1, S2, and S3 in Figure 3 reveals that low browsing frequency and indexing in multiple databases are necessary conditions for journal death. When combined with configuration S4 from Figure 2, contradictory configurations emerge—logically inconsistent scenarios where indexing in multiple databases can lead to both journal survival and demise. This may relate to how anchor points for condition variables were determined or to other unconsidered factors in the impact model. This issue will be addressed in future research.

Open access journal demise follows three pathways: First, articles written solely by authors from non-Western developed countries with low citation and browsing frequencies, yet indexed in multiple databases and charging no publication fees. Second, articles co-authored by multiple authors from non-Western countries with low browsing frequency, indexed in multiple databases, operated by

commercial publishers that charge authors publication fees. Third, articles co-authored by multiple authors with low citation and browsing frequencies, indexed in multiple databases, operated by universities or research institutions that charge authors APCs. Pathway one' s demise stems from low article quality and insufficient revenue streams. Pathways two and three' s demise primarily results from high publication fees deterring author submissions.

5. Reflections and Implications

This study's experimental design and data analysis face two major issues: contradictory configurations and case selection. As previously discussed, contradictory configurations may arise from subjectively determined anchor points for condition variables or from unconsidered conditioning variables. If the issue concerns anchor points, subsequent research should adopt more objective methods, such as expert consultation or cluster analysis, to determine variable thresholds. Regarding case selection, this study only examined 29 technology journals, which may limit generalizability. Future research should expand the sample size and include journals from additional disciplines to enhance external validity.

Note: Figure translations are in progress. See original paper for figures.

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