

Athens Journal of Sports

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Athens Journal of Sports

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- **Dr. Gregory T. Papanikos**, President of Athens Institute. (Economics)
- **Dr. Margo Apostolos**, Academic Member, Athens Institute & Professor, University of Southern California -USC Kaufman School of Dance-USC Glorya Kaufman Dance Medicine Center- & Co-Director- Cedars-Sinai, USA. (Arts, Technology and Sports)
- **Dr. Maria Kosma**, Head, Sports Unit, Athens Institute & Associate Professor, Louisiana State University, USA. (Physical Education & Sport Science)
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The *Athens Journal of Sports* (AJSPO) is an Open Access quarterly double-blind peer reviewed journal and considers papers from all areas of sports and related sciences. Many of the papers published in this journal have been presented at the various conferences sponsored by the [Sport, Exercise, & Kinesiology Unit](#) of the Athens Institute & the [Panhellenic Association of Sports Economists and Managers \(PASEM\)](#). All papers are subject to Athens Institute's [Publication Ethical Policy and Statement](#).

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Athens Journal of Sports

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The current issue is the first of the twelfth volume of the *Athens Journal of Sports (AJSPO)*, published by the Sport, Exercise, & Kinesiology Unit of the Athens Institute under the aegis of the Panhellenic Association of Sports Economists and Managers (PASEM).

Gregory T. Papanikos
President
Athens Institute



Athens Institute for Education and Research *A World Association of Academics and Researchers*

25th Annual International Conference on Sports: Economic, Management, Marketing & Social Aspects 12-15 May 2025, Athens, Greece

The [Sports Unit](#) of ATINER organizes its 25th Annual International Conference on Sports: Economic, Management, Marketing & Social Aspects, 12-15 May 2025, Athens, Greece sponsored by the [Athens Journal of Sports](#). The aim of the conference is to bring together academics and researchers of all areas of sports. Please submit a proposal using the form available (<https://www.atiner.gr/2025/FORM-SPO.doc>).

Academic Members Responsible for the Conference

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Important Dates

- Abstract Submission: **1 April 2025**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **14 April 2025**

Social and Educational Program

The Social Program Emphasizes the Educational Aspect of the Academic Meetings of Athens Institute.

- Greek Night Entertainment (This is the official dinner of the conference)
- Athens Sightseeing: Old and New-An Educational Urban Walk
- Social Dinner
- Mycenae Visit
- Exploration of the Aegean Islands
- Delphi Visit

Conference Fees

Conference fees vary from 400€ to 2000€
Details can be found at: <https://www.atiner.gr/fees>



Athens Institute for Education and Research
A World Association of Academics and Researchers

21st Annual International Conference on Sport & Exercise Science
28-31 July 2025, Athens, Greece

The [Sports Unit](#) of ATINER will hold its **21st Annual International Conference on Sport & Exercise Science, 28-31 July, Athens, Greece** sponsored by the [Athens Journal of Sports](#). You may participate as stream leader, presenter of one paper, chair a session or observer. Please submit an abstract (email only) to: atiner@atiner.gr, using the abstract submission form (<https://www.atiner.gr/2025/FORM-FIT.doc>).

Important Dates

- Abstract Submission: **8 April 2025**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **1 July 2024**

Academic Member Responsible for the Conference

- Dr. Maria Konstantaki, Academic Member, Athens Institute & Senior Lecturer, Buckinghamshire New University, UK.

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More information can be found here: <https://www.atiner.gr/social-program>

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Influence of the First Decade of the *Athens Journal of Sports*

By Duane Knudson*

This study documented the indexing and citations to the first decade of articles published by the Athens Journal of Sports (AJSPo) in Google Scholar, with confirmatory secondary analysis of summary data from Dimensions and OpenAlex database services. A wide variety of articles have been published, with most focus on the business and behavioral/humanities aspects of sports. AJSPo has nearly complete indexing of published articles in these free database services. Article usage is strong in all three databases with median total citations and citation rate similar or better than new journals in the kinesiology/exercise and sport science field. AJSPo has a typical percentage of uncited articles in Google Scholar relative to many journals and contributes research primarily in the categories of the business, behavioral/humanities, and analytics/coaching aspects of sports.

Keywords: *bibliometrics, database, impact, knowledge, research, subject category*

Introduction

The *Athens Journal of Sports (AJSPo)* is an open access double blind peer reviewed journal published by the Sport Unit of the Athens Institute for Education and Research (ATINER) and the Panhellenic Association of Sports Economists and Managers. The journal has an international panel of editors, editorial board, and publishes scholarship on a wide variety of topics consistent with the multidisciplinary philosophy of open discussion of education and research issues related to exercise, sports, and physical activity. Papers are peer-reviewed and evaluated based on seven criteria: Research Design & Methodology, Theoretical Background, Review of the Relevant Literature, Significance of Themes, Relevance of Themes, Clarity and Communication of Arguments Presented, Clarity of Conclusions, and Overall Quality of Analysis.

The 2024 volume of *AJSPo* marked over a decade of continuous publication of interdisciplinary scholarship. While longevity of contribution to knowledge is a marker of journal success, there are other important criteria in evaluating the quality and impact of a journal. The quality of a journal is a contested and multidimensional construct that differs by discipline (Aksnes et al. 2019, Bollen et al. 2009, Martin 1996, Rosseau 2002, Shilbury & Renschler 2007, Stock et al. 2023, West & Rich 2012, Wu et al. 2022). Across inconsistent journal quality nomenclature and statistical analysis of journal citation metrics, however, the three most common quality criteria are: rigor, usage, and prestige (Aksnes et al. 2019, Franceschet 2010, Knudson 2015a, Knudson et al. 2024, Martin 1996, West & Rich 2012, Wu et al. 2022). Rigor represents the selectivity of the peer review process, indicating scholar perception of the difficulty in article acceptance during peer

*Regents' Professor, Texas State University, USA.

review (i.e., low acceptance rate and strict reviews). Usage or popularity is the subsequent citation of articles published by the journal by the scientific community (Bollen et al. 2009, Franceschet 2010, Leydesdorff 2009, Leydesdorff et al. 2016, Zhou et al. 2012). Prestige is scholar and scientific community respect for the importance or relative status of the journal.

The rigor of journals is most often measured using subjective scholar ratings or rankings (Mahmood 2017, Miranda & Mongeau 1991, Shilbury & Rentschler 2007, Silverman et al. 2014), usually within disciplines/fields given variation in research methods, publication, and citation patterns across disciplines. Multidisciplinary journals have wider readership that often includes scholars from disciplines that can be positively biased toward their own fields, specializations, and research topics (Catling et al. 2009, Knudson & Chow 2008, Silverman et al. 2014). Large multidisciplinary journals, however, may also be perceived as rigorous and desirable outlets because of their larger audience. A secondary measure of rigor is journal-reported acceptance rates (Knudson 2014, Knudson et al. 2024), however this is less reliable given no common standard for this metric. Prestigious journals may also have voluminous submissions and high rates of desk rejection by editors.

Journal usage/popularity has been most closely associated with average citations to articles published using metrics like the Impact Factor, CiteScore, and Source-Normalized Impact per paper (Bollen et al. 2009, Franceschet 2010, Knudson et al. 2024, Zhou et al. 2012). Journal prestige has also been examined using subjective scholar ratings (Bray & Major 2022, Mahmood 2017, Miranda & Mongeau 1991, Silverman et al. 2014, Tahai & Meyer 1999) but has also been estimated by various weighted citation metrics that take into account status by the structure (source of citations) of the citation network like Eigenfactor Score, journal h-index, and the SCImago Journal Rank (Guerrero-Bote & Moya-Anegon 2012, Roldan-Valdez et al. 2019). Scholar perceptions of rigor and prestige, however, are more stable over time than journal usage and prestige metrics (Bray & Major 2022, Knudson & Quimby 2023, Tahai & Meyer 1999).

Journal usage is the most logical criterion to examine in a relatively new journal like *AJSPO*, given there is not a lot of data on rigor and any scholar perceptions of prestige are likely biased by a lack of awareness, particularly in small journals with specialized focus. Several previous studies have documented the initial usage and growth of usage in new journals in the field of kinesiology, exercise and sports science similar to *AJSPO*. Knudson (2020a) reported the top 20% cited articles in three scholarly databases for the first 15 years of publication of the journal *Sports Biomechanics*. Similar 10-to-15-year data for multidisciplinary journals in kinesiology (Knudson 2023a) and exercise science (Knudson & Burson 2024) using *Google Scholar* data have been reported. Generally lower usage based on *Google Scholar* citations has been reported for specialized journals in coaching (Knudson 2023b) and tennis medicine and science (Knudson 2020b, 2024a, Knudson & Meyers 2021) than in larger, multidisciplinary journals. *AJSPO* website provides some typical citation metrics from *Google Scholar* on the “Published Papes” page of the journal website without a specific date of data collection.

Given over a decade of publication of *AJSPO*, it is a good time to evaluate the indexing and usage of the journal in the scientific community. This study, therefore, documented the articles and their topics published in *AJSPO* in the first 10 volumes, indexing in *Google Scholar*, and journal usage metrics. Secondary objectives were documentation of indexing and citations to articles in the 11th volume (2024) of the journal, and automatic indexing, citations, and topic classification by two recent database services (*Dimensions* and *OpenAlex*). These data are important to understanding the usage or influence of this relatively new journal (*AJSPO*) in the scientific community, and particularly in the kinesiology, exercise, and sports field.

Method

Bibliometric data on the population of articles published by *AJSPO* were collected from the journal website [<https://www.athensjournals.gr/ajspo>] and the *Google Scholar* database service [<https://scholar.google.com/>]. The number of all *AJSPO* research articles, excluding editorials and introductions to special issues, published from 2014 until 2024 were identified and totaled (N = 177). *Google Scholar* indexing of *AJSOP* articles was examined for the first 10 years of journal publication. Given it takes time for published articles to be found and cited in future research, *Google Scholar* citation data for the journal was focused only on the first decade (2014-2023). Indexing and content analysis was the focus for articles published in the 11th volume in 2024.

The “Advanced search” option of *Google Scholar* was used to search for *AJSPO* articles indexed by this database service. The “Return articles published in” and “Return articles dated between” functions were used to search for *Athens Journal of Sports* articles between 2014-2024. This documented the percentage of eligible *AJSPO* articles indexed by *Google Scholar*. Unindexed *AJSPO* articles were confirmed by manual searches using the “Return articles authored by” and “Return articles dated between” search functions using article titles from the journal website. The numerous searches for indexed *AJSPO* articles contributed to anecdotal discovery of errors and inconsistencies of the *Google Scholar* data.

The investigator manually extracted search data and input results into Microsoft Excel. Data were checked multiple times and missing article meta data confirmed by searches of the journal website. The variables collected were authors, article title, year published, volume and issue, and total citations (C) in *Google Scholar*. Previous studies have estimated the reliability of manual extraction of *Google Scholar* bibliometric data and curation for articles and journals as good with likely error less than 1% (Knudson 2023c, 2024b). Multiple searches were performed beginning in December 2024 with data finalized on January 6, 2025. This closing date is important because *Google Scholar* updates several times a week and does not report time/year-specific citations, so citation data can only be captured at the date of searches.

Additional variables examined included citation rate (CR), percentage of uncited articles (%Uncited), and primary disciplinary topic (Topic). The CR was

calculated by dividing C by time since publication (2025-year published) and %Uncited was the percentage of indexed articles that did not have any citations in *Google Scholar*.

The investigator then classified the topic of all 177 *AJSPO* articles into one of five categories based on the title, abstract, and in limited cases the full article. The topic/subject categories were: Behavioral Sciences/Humanities (BH), Biophysical Sciences (BP), Sports Analytics/Coaching (SAC), Sport Business/Media (SBM), and Other (OT). This was based on the primary discipline of the theoretical framework and independent variables in the articles. If there was not a clear majority focus on a single discipline, articles were classified as OT (e.g., study of learning in a university course). Given the journals mission, articles were identified if they included elements related to the Olympics/Paralympics (OP). Secondary analysis of total C, mean citations, and most common topics in *AJSPO* articles was made by comparison of summary results of searches of the *Dimensions* and *OpenAlex* bibliometric database services.

Data were pasted into JMP® Pro 17.2.0 for statistical analysis. All indexed articles published in the first ten volumes (2014-2023), given the 2024 volume articles had little time to attract citations, were analyzed. Descriptive data were also calculated for the top quartile articles ranked by total C. Given the highly skewed distribution of citation metrics, descriptive statistics were reported as the median (M_e), mean (M), standard deviation (SD), coefficient of variation (CV), and skew (γ). The association between continuous variables were documented using Kendall's Tau (τ) given its superiority in handling associations with heteroscedasticity and outliers (Croux & Dehon 2010). Associations were considered statistically significant with an observed type I error rate of $p < .01$. To facilitate interpretation of the size of associations Tau was converted to a Pearson correlation coefficient (Walker 2003) and coefficients of determination calculated. Categorical data on article topic and OP focus were reports as percentages.

Results

AJSPO published 161 and 177 articles in the first ten and eleven volumes, respectively. Sixty-seven percent ($n = 119$) of the articles in all eleven volumes were indexed in *Google Scholar*. The citation metrics for all first decade *AJSPO* indexed articles (Table 1) had strong positive skews ($1.9 < \gamma < 2.9$) and large variability ($11\% < CV < 119\%$). All indexed first decade articles had M_e C and CR of 7 citations and 1.2 C/year, respectively. Top quartile articles by total C had M_e C and CR of 20 citations and 3.2 C/year, respectively. Only 8% of the first decade *AJSPO* indexed articles were not cited but %Uncited was 38% when including the unindexed *AJSPO* articles over the first ten volumes.

Most first decade indexed articles were related to SBM (37%), BH (31%), and SAC (12%) topic categories. Sixteen percent of indexed *AJSPO* articles included alignment with the Olympics/Paralympics. Similar results were observed for the 11th volume of the journal with 25% for both SBM and BH articles, and slightly higher percentages articles on SAC (31%) or Olympics/Paralympics

(19%). The most cited *AJSPO* articles (top quartile) tended to be from the SBM (56%) and BH (15%) topic categories. The *Dimensions* database serviced indexed 179 *AJSPO* articles, classifying them into five research categories: Commerce, Management, Tourism and Services; Commercial Services; Human Society; Sociology; and Health Sciences. The *OpenAlex* database service indexed 175 articles and classified them into four topic categories: Sport and Mega-Event Impacts; Sports Analytics and Performance; Sports, Gender, and Society; and Motivation and Self-Concept in Sports. The automatic article classification by these two database services supported the investigator's identification of *AJSPO* emphasis on SBM, BH, and SAC research.

Table 1. Google Scholar Citation Metrics for the First Decade of Indexed *AJSPO* Publication

Metric	Skew	M_e	M	SD	CV (%)
Top Quartile (n = 27)					
Year	0.6	2017	2017	2.4	12
Authors(n)	0.8	2.0	2.0	0.9	47
Citations	2.1	20	24	15	60
CR	1.2	3.2	3.4	1.8	53
All Articles (n = 108)					
Year	0.01	2018	2018	2.8	14
Authors(n)	1.0	2.0	2.0	1.1	54
Citations	2.9	7.0	9.5	11.3	119
CR	1.9	1.2	1.5	1.5	100

Note: See methods for variable definitions and abbreviations.

Two of six associations between the *AJSPO* citation metrics for the first decade were statistically significant (Table 2). There was a negative association ($r = -0.337$) between the year of article publication and C and a positive association ($r = 0.911$) between C and CR.

Table 2. Correlation (r) Matrix for First Decade *AJSOP* Citation Metrics

	Authors	C	CR
Year	-.204	-.337*	.144
Authors		-.170	-.237
C			.911*

Note: Kendall's τ values were converted to Pearson correlation coefficients (Walker 2003).
*Statistically significant ($p < 0.01$) associations.

Discussion

The current data indicates typical visibility and usage of *AJSPO* articles in its first decade of publication compared to other kinesiology and specialized exercise and sports science journals. *AJSPO* is currently indexed in *EBSCO*, German and Norwegian database services, and free services like *Dimensions*, *Google Scholar*, and *OpenAlex*. Sixty-seven percent of its articles were indexed in *Google Scholar*, this was higher than the 54% reported for a coaching journal (Knudson 2023b), 12 to 15% in tennis science journals (Knudson 2020b, Knudson & Meyers 2021), but

lower than the 95% for a multidisciplinary exercise science journal (Knudson & Burson 2024). About 100% of *AJSPO* articles were indexed by *Dimensions* and *Open Alex*.

The high percentage of indexing of *AJSPO* in *Google Scholar* led to median usage of published articles of 7 citations and 20 citations for top quartile cited articles. These usage values were larger than those reported for small, specialized tennis medicine and science journals (Knudson 2020b, Knudson & Meyers 2021). Mean C to all *AJSPO* articles were smaller according to *Dimensions* (2.9 citations) and *OpenAlex* (4.7 citations) than the 9.5 citations in *Google Scholar*. Mean and median CR for all first decade *AJSPO* indexed articles were 1.2 and 1.5 citations per year. This was similar to values reported for an international exercise science journal (Knudson & Burson 2024).

The low rate of uncited, indexed articles (8%) was impressive. The %Uncited for all *AJSPO* published articles in the first decade (38%) was between the 15% to 23% for exercise science journals (Knudson 2023b, Knudson & Burson 2024) and the 41 to 44% for kinesiology/exercise science journals in curated databases (Knudson 2015b, 2015c). The *OpenAlex* database did report a slightly lower uncited rate (29%) for all indexed *AJSPO* articles. Substantial percentages of uncited articles, even after many years, are a ubiquitous phenomenon in scholarly journals (Ghosh 1975, Nicolaisen & Frandsen 2019, Stern 1990). While some scholars believe the high visibility and citations to *AJSPO* articles may be due to the open access nature of the journal, the belief in FUTON (full text on the net) bias (Murali et al. 2004) in favor of open access articles is not supported by mixed findings of a large body of research across many disciplines (Langham-Putrow et al. 2021).

Citation patterns in this study were also consistent with the most common topic/ disciplinary categories of articles published in the journal (SBM, BH, and SAC). Journals in these fields/disciplines tend to have lower citation rates than in biomedical and sports medicine journals (Knudson 2015a, 2020a, Owlia et al. 2011). However, top cited *AJSPO* articles in SBM, BH, and SAC categories did have outstanding (3.7 to 8.5 C/year) citation rates (Chew & Leng 2016, Leite 2017, Papanikos 2015). In addition, all topic areas published by *AJSPO* articles resulted in consistent number of mean authors (1.4 to 2.4) over the first decade that is different from the dramatic increase in numbers of authors in biomedical and sports medicine journals (Knudson 2012, Thelwall & Maflahi 2022, Wuchty et al. 2007), hyperauthorship (Cronin 2001), and other unethical authorship practices (Jakab et al. 2024).

These results indicate that *AJSPO* has good visibility and usage according to *Google Scholar* for a relatively new, 11-year-old journal in the kinesiology/ exercise and sport science field. Authors can use these results to expect strong indexing and usage of an *AJSPO* published article, particularly with subjects of Olympics, business, behavioral/humanities, and analytics/coaching aspects of sports. Like many new journals, however *AJSPO* articles are not currently found in selective, subscription bibliometric database services like *Scopus*® and *Web of Science*™.

It is important to note that two significant associations of journal metrics were consistent with previous bibliometric research. The year of publication of articles

affects the years available to accrue citations given the skewed, cited half-life of most citation metrics. The weak ($r^2 = 11\%$) negative association of year of publication with C to *AJSPO* journals is consistent with this phenomenon. CR, which may be the least biased measure of scholarly usage, was not associated with year of publication, so the usage of *AJSPO* articles can be strong irrespective of when it was published. The strong ($r^2 = 83\%$) positive association is also logical given C is used to calculate CR. The lack of associations of other variables indicates that the number of authors does not influence C or CR in the journal.

Limitations of this study include the use of only one bibliometric database service. This, however, was necessary given the great coverage of *Google Scholar* and the lack of indexing of *AJSPO* in the major curated databases. Like all databases, *Google Scholar* has errors in the automatic internet crawling of journals, repositories, academic social media sites, and the references of indexed publications. For example, this study identified unindexed/uncited *AJSPO* articles (e.g., Bakkenbüll & Dilger 2020, Jedlicka & Predel 2018, Ziakas & Boukas 2014) in primary searches using “Return articles published in- Athens Journal of Sports,” even though specific searches for these articles returned records that included citations by subsequent *AJSPO* articles (Papanikos 2020, 2022, 2024). The study was also limited to journal influence from subsequent citation and there are other altmetric variables (e.g., views, downloads, social media mentions) that can be examined. The specific disciplinary categories were subjectively assessed by the author, have unknown reliability, and may vary from classification by other scholars in a few articles. The reliability of manual citation curation was likely good (Knudson 2023c, 2024b), therefore the study limitations do not likely influence the result of growing indexing and influence of *AJSPO* documented by this study.

Conclusions

Articles published in the first decade of *AJSPO* are well indexed in free database services like *Dimensions*, *Google Scholar*, and *Open Alex*. These articles are cited regularly, for a relatively new, specialized journal. *AJSPO* has a typical percentage of uncited articles in *Google Scholar* and *OpenAlex* relative to many journals. A wide variety of articles have been published in *AJSPO*, with most focus on the business, behavioral/humanities, and analytics and coaching aspects of sports. *AJSPO* articles have traditional authorship collaboration with no evidence of unethical inflation of coauthorship. *AJSPO* has good visibility and usage in all three databases for a relatively new journal in the kinesiology/exercise and sport science field.

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Citations and Readership: A Bibliometric Analysis of the *Athens Journal of Sports*

By Gregory T. Papanikos*

The Athens Journal of Sports (AJSPo) first appeared in 2014 as an academic quarterly journal, fulfilling the mission of the Athens Institute, which was established in 1995. This paper presents bibliometric statistics on articles published from the journal's first volume in 2014 to its most recent volume in 2024. Knudson (2025) provided a comparative evaluation of AJSPo, and this study serves as a complement to his work. Key bibliometric statistics are analyzed, including the number of citations per published paper (as reported by Google Scholar and ResearchGate), the number of reads recorded by ResearchGate, and the year of publication. Over its first 11 years, AJSPo published 177 papers—an average of 16 per year—authored by 369 researchers from 48 different countries. A regression analysis indicates that the publication year positively associated the number of citations per paper, though notable exceptions exist. Additionally, as expected, the number of reads reported by ResearchGate has a positive association with citations. Surprisingly, the number of authors per paper has a negative association with the total number of citations per paper.

Keywords: Athens Journal of Sports (AJSPo), Bibliometrics, number of authors, paper reads, Google Scholar, ResearchGate.

Introduction

Independent open-access publishing has been increasing, mainly due to the role of technology (the internet), which has significantly reduced overall costs by eliminating the need for printed journals¹. All academic journals now appear as e-journals, although some are still available in print. The Athens Institute, a global association of academics and researchers based in Athens, has capitalized on this technological advancement and began publishing a number of e-journals in 2014, with many more added in the following years. As of 2025, it publishes 20 scientific journals (<https://www.athensjournals.gr/>).

In addition, computing and internet technology has enabled an independent, almost automatic evaluation of visibility—specifically, how many academics access and read the journals articles—and contribution—how many academics cite papers published in the journal in their subsequent publications. These two metrics, now openly available for verification, are applied here to a specific journal published by the Athens Institute.

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¹This has drastically changed the private publishing industry, making competition very stiff to the point that some engage in unfair practices, including slandering independent publishers. These issues have been examined in Papanikos (2022a, 2022b) and Kumar (2022a, 2022b).

The aim of this paper is to analyze the number of citations based on Google Scholar and ResearchGate and the numbers of reads as reported and explained by ResearchGate. This study was inspired by the work of Knudson (2025), who evaluated the Athens Journal of Sports (AJSPo) using available bibliometric statistics. He concluded that:

These results indicate that AJSPo has good visibility and usage according to Google Scholar for a relatively new, 11-year-old journal in the kinesiology/exercise and sport science field.

This paper extends this discussion by examining (a) how the year of publication affects the number of citations and (b) how reads are related to citations. To achieve this, we develop a simple regression model in which the number of citations depends on the year of publication, the number of reads, and several other factors, such as the number of authors per paper, the paper length, and the national affiliations of the authors.

Including this introduction, the paper is organized into five sections. The next section provides a brief overview of the journal, its mission, and its history. Section three presents descriptive statistics for all relevant variables, except for reads and citations, which are discussed in section four. Section five reports the regression results, and the final section summarizes the main findings.

The History of the AJSPo

The AJSPo was one of the first academic journals published by the Athens Institute. The decision to launch the journal was made in 2010 during the two annual sports conferences organized by the Sports Unit of the Athens Institute. Members and friends of the institute suggested that, instead of publishing a book of proceedings, it would be more efficient and effective to start an academic journal on sports.

The first annual sports conference began in 2000 and has since been held every year in the second week of May in Athens. In 2005, a second sports conference was introduced, taking place during the last week of July.

In 2025, the institute will organize its 25th (<https://www.atiner.gr/sports>) and 21st (<https://www.atiner.gr/fitness>) annual conferences, respectively. Selected papers from these two conferences were previously published in a book of proceedings, with seven such books published by 2010 (<https://www.atiner.gr/spo-books>).

After 2010, papers presented at these conferences were considered for publication in AJSPo instead of the book of proceedings, which was discontinued. However, all conference participants are informed that acceptance of an abstract for presentation does not guarantee publication, as the journal follows a separate evaluation process, which is clearly stated on its website.

Around 2012, a series of working papers was introduced, along with a conference paper presentation series. A key development was that AJSPo also

began accepting submissions from authors who had not presented at any of the Athens Institute's conferences.

Thus, AJSPPO had a strong foundation to build upon. The two conferences, along with independent submissions, provided a substantial pool of papers for the editorial board to review. The acceptance rate was around 40%, though the actual number might have been lower, as many authors who presented at the conferences were discouraged from submitting due to their work not meeting the basic academic criteria of a scholarly paper. Instead, such papers were included in the working paper series or the conference presentation series, the latter of which is not peer-reviewed.

The Athens Institute is not a publishing house; its mission is different. Any academic activity should align with the institute's goal of bringing together scholars from various disciplines and countries to discuss academic issues. The journal publications support this mission. Thus, AJSPPO had to cover a broad range of topics within the vast field of sports while also serving as a forum for scholars from diverse backgrounds to publish their work. The wide variety of topics has already been noted by Knudson (2025). In this paper, I will explore another aspect beyond the different fields of sports—namely, the mission to bring scholars together from different countries.

I want to comment on this point, as many academics view the journal's broad scope as a weakness rather than a strength. Both perspectives have merit. However, I believe that both academic approaches should be allowed to flourish, leaving the academic community to determine which is preferable. Based on my extensive experience in fostering academic collaboration since 1995, I argue that while academics may be highly specialized, they should still stay informed about developments in their broader research field—or even beyond.

Finally, I would like to highlight a unique aspect of AJSPPO's blind review process. The journal follows an open review model. In addition to the standard desk review (accept/reject decision) and two blind peer reviews, a blind version of the paper is uploaded to the journal's website, where the global academic community is invited to provide feedback before publication. This approach has been highly successful, allowing for broader engagement, with many academics reading and commenting on papers before they are published. This might also explain why on average the AJSPPO is doing better as was found by Knudson (2025). In fact, his paper was reviewed by the two editors of the journal, who provided comments, as well as six other reviewers coming from Canada, Colombia, Oman, Portugal, Qatar and USA. Reading his paper myself, I was inspired to write this one. This is what it means to bring together academics from different countries and disciplines.

Once published, the papers are uploaded to the "Forthcoming" section of the journal's website and are picked up by two widely used platforms that track bibliometric statistics: ResearchGate and Google Scholar. ResearchGate, a platform with over 20 million academics and researchers, provides data on the number of reads and citations for each paper. Google Scholar, on the other hand, tracks only citation counts. Artificial Intelligence (AI) powered database services like Dimension and OpenAlex are also finding AJSPPO articles (Knudson, 2025).

In this paper, I analyze the selected citation metrics and altmetrics of 177 papers published in AJSPPO between 2014 and 2024. Google Scholar provides citation data for all 177 papers. However, on ResearchGate, we were unable to retrieve citation metrics for five papers, leaving us with data for 172 papers.

Google Scholar and ResearchGate citations of AJSPPO articles provide evidence of the journal's scholarly impact and usage. I also examine several additional variables, including (a) year of publication, (b) number of co-authors, (c) national affiliations of authors, and (d) number of pages per paper. All data were retrieved from AJSPPO. The next section presents summary statistics for these variables.

Descriptive Statistics

This section presents descriptive statistics for the following variables: (a) paper length, (b) number of authors per paper, and (c) authors' national affiliations. These summary statistics are depicted in the following three tables.

Table 1 displays the page length of each paper. Although there is a policy limiting papers to 10,000 words, the inclusion of graphs and figures means that the number of pages does not always correspond to the word count. In the modern publishing landscape, shorter papers and books tend to be more appealing than longer ones. Does paper length influence readership and, consequently, citations? This question is addressed in the next two sections.

Table 1 also indicates that over 11 years (2014–2024), 177 papers were published, totaling 2,752 pages. Paper lengths range from 8 to 38 pages, with an average of 21 pages (not shown in the table). The most common length (mode) is 14 pages.

Table 1. *Page Length of AJSPPO Papers*

Pages per Paper	Number of Papers	Total Pages
8	11	88
10	18	180
12	22	264
14	39	546
16	31	496
18	22	396
20	16	320
22	6	132
24	4	96
26	3	78
28	2	56
30	1	30
32	1	32
38	1	38
Total	177	2752

Table 2 presents the number of authors per paper. Of the total published papers, 67 (37.9%) were single-authored, followed by 59 papers (33.3%) co-authored by two scholars. Fewer than one-third of the papers had more than two authors.

Table 2. Authors per *AJSPO* Paper

Authors	Count	Percent	Cumulative Count	Cumulative Percent
1	67	37.9	67	37.9
2	59	33.3	126	71.2
3	30	16.9	156	88.1
4	14	7.9	170	96.0
5	5	2.8	175	98.9
6	1	0.6	176	99.4
7	1	0.6	177	100

If authors actively promote their work among peers and at conferences, a higher number of authors should correlate positively with readership and citations. The conclusion reached by Knudson (2025), cited earlier, may be explained by the fact that most of the published papers were presented at one of the two sports conferences sponsored by the journal. As a result, other participants became aware of their work, read it, and, in some cases, cited it.

One of the stated missions of the Athens Institute is to bring scholars from different countries together. This applies not only to conferences but also to publications. Table 3 reports statistics on the national affiliations of authors whose work appeared in the *AJSPO*.

The total number of authors is 369, representing 48 different countries. Authors from the USA accounted for 22.8% of the total, followed by Germany (9.7%), Canada (7.5%), and the UK (7.3%).

In the regression section of this paper, two dichotomous variables were created: one indicating whether an author is from the USA (1 = USA, 0 = otherwise) and another indicating whether an author is from a European country (1 = European country, 0 = otherwise). These categorical variables were used as controls for the number of citations per paper.

The next section presents descriptive statistics on the number of citations and reads per paper published in *AJSPO*. It also includes graphs illustrating correlations between reads, citations, and other control variables.

Reads and Citations

The number of citations of a paper is a proxy measure of the academic usage/impact of the paper. The total citations of the papers published in a given journal is one of many proxy measures of the academic usage/impact of the journal (e.g., Wu et al. 2022). In addition, how many academics and researchers read a paper is one many alternative metrics (altmetrics) of the preliminary and societal usage of journal articles. However, the number of reads may not be a good, long-term

usage/impact indicator because academics read the paper, but for a variety of reasons they do not cite it as important/relevant in their subsequent scholarly publications. Despite scholar variation in selection and use of citations, altmetric research has tested the hypothesis that these two are positive related (e.g., Peres et al 2022) and is also tested in the next section of this paper.

Table 3. National Affiliations of Authors

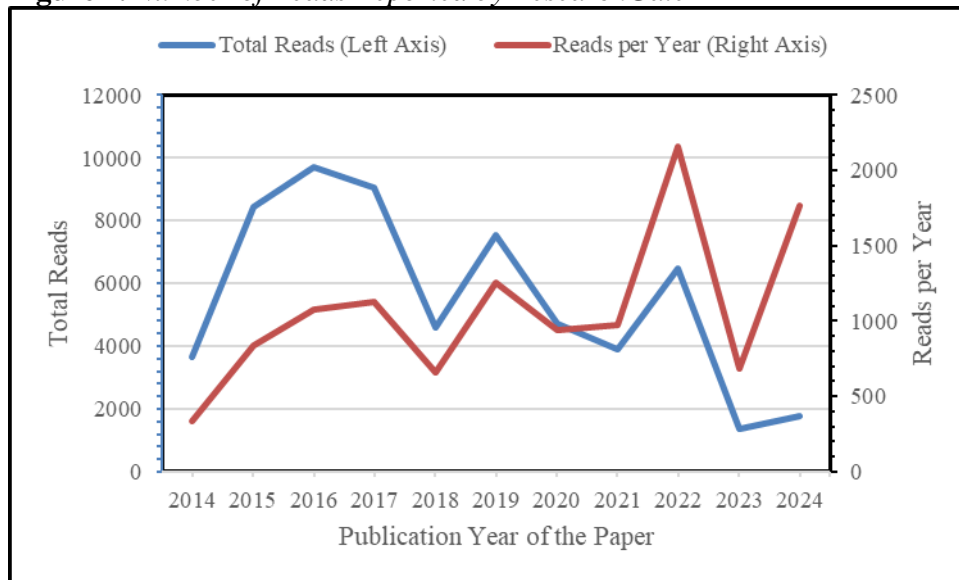
	Country	Count	%		Country	Count	%
1	USA	85	22.8%	25	Japan	3	0.8%
2	Germany	36	9.7%	26	Morocco	3	0.8%
3	Canada	28	7.5%	27	New Zealand	3	0.8%
4	UK	27	7.3%	28	Philippines	3	0.8%
5	France	17	4.6%	29	Romania	3	0.8%
6	Portugal	17	4.6%	30	Singapore	3	0.8%
7	Brazil	16	4.3%	31	Albania	2	0.5%
8	Türkiye	11	3.0%	32	China	2	0.5%
9	Spain	9	2.4%	33	Indonesia	2	0.5%
10	Nigeria	8	2.2%	34	Jamaica	2	0.5%
11	Taiwan	8	2.2%	35	Lithuania	2	0.5%
12	Greece	7	1.9%	36	Poland	2	0.5%
13	Hungary	7	1.9%	37	Russia	2	0.5%
14	Bulgaria	6	1.6%	38	Sweden	2	0.5%
15	Trinidad and Tobago	6	1.6%	39	Tunisia	2	0.5%
16	Finland	5	1.3%	40	Australia	1	0.3%
17	Iran	5	1.3%	41	Belgium	1	0.3%
18	Italy	5	1.3%	42	Cyprus	1	0.3%
19	South Korea	5	1.3%	43	Egypt	1	0.3%
20	Israel	4	1.1%	44	India	1	0.3%
21	Oman	4	1.1%	45	Iraq	1	0.3%
22	Slovenia	4	1.1%	46	Lebanon	1	0.3%
23	South Africa	4	1.1%	47	Mozambique	1	0.3%
24	Czech Republic	3	0.8%	48	Slovakia	1	0.3%

In this section we examine reads and citations as reported by ResearchGate and Google Scholar respectively (see Figures 1 & 2 below). The number of citations from both sources are very similar and any differences are due to the slightly different methodologies applied. Actually, ResearchGate gets most of its information from Google Scholar. In this section, I use only the citations from Google Scholar. In the next regression section, I use both sources.

The number of reads is reported in Figure 1. The data were collected on 31 January 2025. Figure 1 reports total reads and reads per year. For example, papers published in 2024 had 11 years of publications. The total reads were 3661 and the average after 11 years was $3661/11=333$. Since the years of publications is an important variable, it is worth mentioning several important observations. First, the

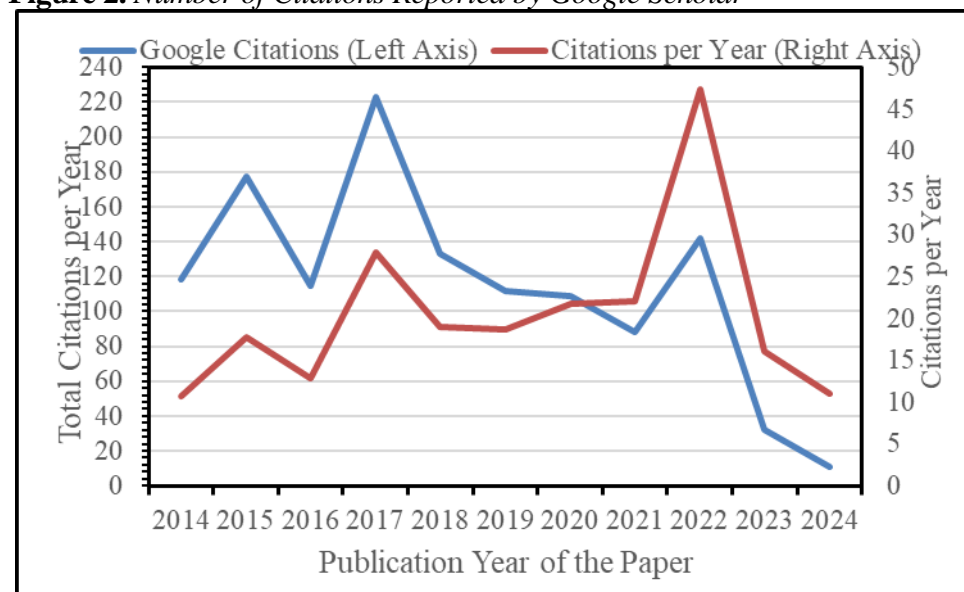
total number of reads decrease as the year of publication increases (the paper has fewer years of circulation). Second, the average number of reads shows a different trend. Relatively newer paper has higher reads per year as older papers. This might be an indication of the overall increase of the visibility of the journal. More and more people know about the journal and once they receive the information, they download the new papers to read them. It might also reflect the fact that the list of those who receive the journal is growing every year. It is important to note that actual reads of AJSPO articles are likely much higher than is documented by this one academic social networking site (ResearchGate).

Figure 1. Number of Reads Reported by ResearchGate



Note: Data were retrieved 31 January 2025

Figure 2. Number of Citations Reported by Google Scholar



Note: Data were retrieved 31 January 2025

Figure 2 reports data on citations as reported by Google Scholars. Not reported here are the number of citations recorded by ResearchGate because they are very similar to the Google Scholar citations. First, total citations increase with time. Older papers have more citations than new papers. Second, the citations per year are higher for the new papers relative to old papers and this may be interpreted in similar way that was interpreted the same observation for the number of reads in Figure 1. It can be considered as the journal effect. Thirdly, both variables in Figure 2 show great variability resulted in very high values in 2017 and 2022. This is the result of specific papers which are not examined here as our purpose is not to look at variations between papers but general trends over years.

Regression Analysis

It is regularly observed in bibliometric research that the number of citations depends on the year of publication, with older publications tending to have a higher number of citations. We also consider citations as a function of the visibility of both the journal and the paper itself. Other researchers first read a paper and then decide whether to use it in their work, sometimes leading to citations. Thus, the number of reads, as reported by ResearchGate, is examined in altmetric research as an important, early indicator of potential scholarly impact measured by citations.

Additionally, a series of other variables were considered, as mentioned in the third section of the paper. Among these variables, only the number of authors had a statistically significant negative association with AJSPo citations. The number of pages and national affiliations did not have significant associations with AJSPo citations. Therefore, I report only the variables significantly associated with citations to AJSPo articles.

Regressions were applied to both the first ten years (2014–2023) and the entire dataset spanning 11 years (2014–2024). Since there were no differences in the results, I report only the findings for the full 11-year period.

Initially, regressions were applied using a simple linear model, but the residuals were not normally distributed, exhibiting a nonzero mean and non-constant standard deviation. To address this, the variables were transformed into logarithms. After this transformation, the normality test failed to reject the hypothesis that the residuals are normally distributed. Therefore, I report the results based on the logarithmic transformation of the variables. I report robust standard errors (White's heteroscedasticity-consistent standard errors), even though there are no significant differences from OLS estimates.

Table 4 presents the regression results. Seven estimations are provided: the first three use Google Scholar citations, while the last four use ResearchGate citations. The first six were estimated using ordinary least squares (OLS), and the last one was estimated using quantile regression (median). I follow a stepwise approach, adding one statistically significant variable at a time.

I began with the variable “years of publications.” The estimated coefficient of this variable ranges from a minimum of 0.44 to a maximum of 0.67. All seven estimates are statistically significant at the 1% level. Thus, the conclusion that emerges is that

older publications receive a higher number of citations. If we interpret the coefficients as elasticities, then a 10% increase in years since publication —approximately one additional year (1.1)—increases the number of citations by 4.4% to 6.7%, or an average of about 5.5% across all seven coefficients. The average number of citations per paper was 7.25, meaning that a 5.5% increase implies approximately one additional citation every two and a half years.

The negative sign of the number of authors is puzzling, as the reported citations are per paper, not per author. This variable is statistically significant at the 1% level in equations (2), (3), and (6) and at the 5% level in equations (5) and (7). The coefficient estimates range from an absolute minimum of -0.28 to an absolute maximum of -0.41. There were 369 authors across 177 papers, averaging 2.08 authors per paper. One could logically expect the sign to be positive, as more authors could increase the paper's visibility and dissemination, however scholarly usage/ impact is multidimensional and the addition of additional coauthor collaboration may not, automatically increase the quality and eventual impact of the paper.

Table 4. Regression Results Predicting Citations from AJSP0 Article Metrics (All explanatory variables are in logarithms)

	Log(Google Citations+1)			Log(ResearchGate Citations+1)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant (t-statistic)	0.47* (2.7)	0.61* (3.6)	-0.75* (3.3)	0.43* (2.5)	0.58* (3.2)	-0.78* (3.6)	-1.20* (3.9)
Years (t-statistic)	0.63* (6.2)	0.67* (6.2)	0.56* (6.2)	0.54* (5.2)	0.57* (5.3)	0.47* (5.4)	0.44* (3.7)
Authors (t-statistic)		-0.34* (2.5)	-0.41* (3.8)		-0.28** (2.2)	-0.33* (3.5)	-0.29** (1.9)
Reads (t-statistic)			0.34* (8.0)			0.32* (7.6)	0.41* (7.9)
R ²	0.1564	0.1821	0.4003	0.1410	0.1632	0.4174	0.2599 [§]
R ² -adjusted	0.1515	0.1727	0.3896	0.1360	0.1533	0.4070	0.2466 [§]
F-Statistic (probability)	32.43 (0.00)	19.37 (0.00)	37.38 (0.00)	27.93 (0.00)	16.48 (0.00)	40.12 (0.00)	2.2 [#] (0.00)
Jarque-Bera (probability)	1.63 (0.44)	1.29 (0.52)	0.41 (0.81)	5.15 (0.08)	4.49 (0.11)	5.07 (0.08)	3.27 (0.19)
N	177	177	177	172	172	172	172

Notes: I added one to the dependent variables because few papers had zero citations. *Significant at 1%. **Significant at 5%. [§]Pseudo R². [#]Sparcity Statistic (statistically significant if >1.96).

The final variable reported in Table 4 is the number of reads, as reported by ResearchGate. The coefficient has the expected sign: an increase in the number of reads leads to an increase in the number of citations. The coefficient ranges from 0.34 to 0.41 and has the highest t-statistic among all variables. The average number of reads per paper was 356. This implies that a 10% increase in the number of reads—equivalent to 35.6 additional reads per paper—would increase the number of citations by 14. Thus, the visibility of the journal, as measured by the number of reads, along with authors' efforts to promote their work through conferences and other means, tends to contribute to more citations.

The inclusion of the number of reads significantly increases the explanatory power of the model. When only the years since publication and the number of

authors is included, the coefficient of determination (R^2) is less than 20%, ranging from 13.6% to a maximum of 17.3%. However, when the number of reads is added, the coefficient of determination more than doubles, reaching 39% in equation (3) and 40.7% in equation (6).

A key challenge in estimating such models is the presence of heteroscedasticity, i.e., the residuals violate the assumption of constant variance. Transforming the variables into logarithms mitigated the problem of skewed observations. The Jarque-Bera statistic was used to test the normality of the residuals. The test fails to reject the hypothesis of non-normality in the first three equations, where Google Scholar citations are used as the dependent variable. However, when ResearchGate citations are used as the dependent variable, the hypothesis of non-normality is rejected at the 5% level. In this case, I estimated the regression equation using median quantile regression, which is less sensitive to extreme values and provides more reliable estimates than OLS, as it does not assume normally distributed errors. The sign of the coefficients remains the same, and the coefficient for the number of reads increases to 0.41.

Summarizing the above results: the number of years since publication increases the total number of citations, and the number of reads also positively affects citations. However, if we take these results at face value, writing a *AJSPO* paper with one or more co-authors, had a negative association with the number of citations—suggesting that single-authored papers tended to receive more citations. Perhaps a better interpretation of this result, is that this association is good evidence that *AJSPO* journal readers should not assume larger numbers of coauthors is positively associated with long-term scholarly usage/impact.

Conclusions

This paper builds on the work of Knudson (2025), which evaluated the first eleven years of *AJSPO* publications. The aim was to estimate the effect of publication years on the number of citations using two sources: Google Scholar and ResearchGate. As expected, the number of years since publication had a positive effect on the number of citations.

A potentially important altmetric variable for *AJSPO* was the number of reads, which was strongly positively associated with the number of citations. Surprisingly, the number of authors was found to have a negative effect on the number of citations. Other variables were included in the regression, but they were not found to be statistically significant, such as the national affiliation of the author, the number of authors, and the number of pages per paper.

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Efficient Combating the Downward Spiral: How the Olympic Movement is Responding to the Market Failure of Sports Journalism & the Rise of Digitalization

*By Christoph Bertling**

Sports journalism is in a deep crisis. Functional, structural and organizational deficiencies can be observed worldwide. Editorial offices are being outsourced, staff cut, travel costs minimized. These profound disruptions are resulting in inferior coverage of numerous sporting events and sports. Some sporting events and types of sport, for example, are no longer covered by established editorial teams due to cost-cutting constraints. This has far-reaching consequences for sports organizers and players. Important information is not disseminated and some information is passed on incorrectly and inadequately. Such tendencies can also be observed in the Olympic Games. As this downward spiral can have serious consequences for sports organizations such as the International Olympic Committee (IOC), the Olympic Movement has long since reacted to this. This paper will show how the Olympic Movement has built up its own media structures and has now (cleverly) strategically positioned itself in recent years with so-called vertical media structures. It will be shown how the IOC has managed to make itself largely independent of sports journalistic reporting and to provide its stakeholders with high-quality reporting through its own media and public relations work, while at the same time protecting the Olympic idea/movement. The increasing integration of AI technologies will most likely reinforce the trend of sports organizations establishing their own media houses and increasingly refining their media structures.

Keywords: *crisis, sports journalism, media strategies, media house, Olympic movement*

Introduction

A severe economic crisis has hit large parts of sports journalism. The extent of this crisis varies between the different types of media, but the economic basis for traditional sports journalism is deteriorating sharply in all types of media - print, TV and social media (cf. Rojas-Torrijos & Nölleke 2023, 2022, Schallhorn et al. 2022). This development can be observed worldwide and no longer stops at the big players in the profession. The billion-dollar US sports media company ESPN recently responded to a sharp loss of subscribers with a change in strategy. Part of the strategy involves laying off around 100 employees. The sports department of the “New York Times” was taken over by the website “The Athletic” and the entire sports editorial team was outsourced. The legendary,

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consistently high-quality sports magazine “Sports Illustrated” recently admitted to having extensively misused AI technologies.

These are no longer exceptions (see state of research) and lead to the question: How serious and existential are the problems and disorders? And can these disruptions be remedied in the future or will they even intensify? To what extent must sports organizations react to this in order not to jeopardize their brand and image value? This requires a theoretically sound classification. Such an assessment of the overall situation and its development is of great importance for modern sports organizations - such as the International Olympic Committee (IOC) - which (have to) interact with the public to a considerable extent. After all, the question arises as to whether sports organizations need to protect themselves from low-quality reporting and to what extent they can, or perhaps even have to, develop new media structures that are effective in terms of publicity.

State of Research

A comprehensive literature review shows that the cases described are not special cases, but that there are no more detailed analyses of how they came about. In academic works (see for others Rehbach 2024, Grimmer 2018, Horky et al. 2018, Bölz 2017, Neidhardt 2007, Schierl 2007, Schaffrath 2006, Schauerte & Schwier 2004, Schramm 2008, Loosen 1998) as well as in practice-oriented publications (see Beils 2023, Wiske & Kaiser 2023, Wiske 2020, Horky & Kamp 2012, Leyendecker 2006), the development and status quo of sports journalism is assessed as extremely negative. There is a broad consensus that sports journalism is undergoing fundamental change, which is jeopardizing its economic basis and journalistic quality.

The crisis conditions described in science and practice can indeed be classified as existentially threatening for sports journalism. This is particularly the case because sports journalism appears to be subject to exceptionally severe structural cutbacks, which lead to organizational difficulties and these in turn lead to highly opportunistic actions in sports editorial offices. This connection should be briefly explained (see Figure 1).

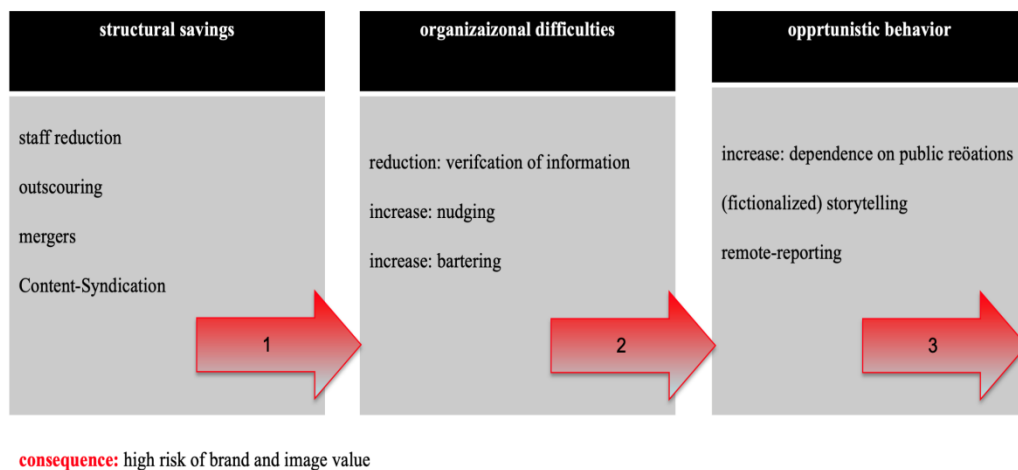
A review of the literature reveals structural disruptions in the form of multiple market failures and business restructuring of editorial units. In sports journalism, there is a significant reduction in staff and the outsourcing of entire editorial units (i.e. outsourcing processes). National sports newsrooms are being thinned out and often operate with fewer than ten full-time sports editors (see also Beils 2023, Bertling & Schierl 2020, Horky et al. 2018). Collective bargaining regulations are being undermined by outsourcing sports editorial teams and buying their content back in as newly established limited companies (cf. Beils 2023, Widmer 2023, Kraus 2021, Weissenburger 2019). Sports newsrooms are being dissolved, merged or outsourced. This was evident in 2023 internationally at the “New York Times” and in Germany at numerous smaller local editorial offices as well as at the various sports editorial offices of Springer-Verlag (cf. Beils 2023, Widmer 2023, Kraus 2021, Bertling & Nieland 2010, Mosen 2021, Weissenburger 2019).

Organizational difficulties can be seen, for example, in the lack of control mechanisms and the simultaneous expansion of external supplies. For example, ready-made media content is purchased and integrated and distributed in the company's own sports journalism products without any control mechanisms or options. The live signal is obtained from the sports broadcasters, who (can) suppress various content (such as violence, political statements, etc.) for marketing reasons (see Bertling 2024, Ludwig 2024, Beils 2023, Bertling & Schierl 2020, Horky et al. 2018, Horky & Kamp 2012).

Opportunistic behaviour is evident in sports journalistic production and services in many respects: licensing and broadcasting costs have risen so sharply in many sports editorial offices that every day, basic editorial work processes such as on-site research, verification of information, editing and quality assurance through fact-checking are no longer (or can no longer be) paid for (cf. Wiske & Kaiser 2023, Russ-Mohl 2017, Schaffrath 2009). Strong staging (through particularly accentuated storytelling approaches), manipulation and particularly strong cases of fraud in reporting as well as unreflected adoption of PR material can be observed in many cases (cf. Wiske & Kaiser 2023, Bouhs & Mathwig 2019, Grimmer 2012, Leyendecker 2006, Schauerte & Schwier 2004). Since sports journalists are often no longer on location at sporting events, but report from home using so-called remote techniques, it is often almost impossible to assess the facts and behavior of actors (cf. Beils 2023, Wiske 2020, Schaffrath 2006).

These developments, as described in many academic and practice-oriented publications, are alarming. They are confirmed by numerous experts from the sports media complex. The conclusion suggests itself that sports journalism is in a downward spiral that leads to inferior quality as shown in Figure 1.

Figure 1. *The Downward Spiral of Sport Journalism*



In-depth analyses and theoretical classifications as to why this crisis has occurred from an economic and journalistic perspective and to what extent it will develop in the future (1) are not yet available. Such a classification and the resulting media strategy conclusions (2) are of central importance for the brand and public relations policy of sports organizations. These two aspects are addressed in this article.

Methodology & Theoretical Framing

The development and the seemingly crisis-ridden state of sports journalism can be largely attributed to a particularly strong, complex economic-journalistic interaction and interplay in this sub-sector, as well as the associated information asymmetries/ differences and shifts in the mutual transfer of goods and information between sports journalism and sports organizations.

Accordingly, two approaches of the New Institutional Economics (NIE)² are used to shed light on these two aspects.

a) The *principal-agent theory* can be used to explain why sports journalism is most likely heading more and more towards an existential crisis. The principal-agent theory focuses primarily on the division of labor between the principal and the agent. The suboptimal control and monitoring possibilities due to information gaps between the two (contractual) parties play a central role. Information asymmetries and trust structures are of particular importance (Akerlof 2005, Akerlof 1970). In (sports) journalism, there are numerous principal-agent constellations (with and without contractual frameworks) that are characterized by strong information asymmetries. This can lead to enormous moral risks and a market failure of journalistic functions - and thus this theory can be used to explain the first sub-question.

b) *Transaction cost theory* - and vertical integration in particular - is a good way of identifying the possibilities of a media strategy for sports organizations since digitalization. Transaction cost theory deals in particular with information and communication costs (search costs, negotiation costs, enforcement, value protection and control costs) and assumes imperfect information processes, distributions and knowledge (Coase 1960, 1937, Kiefer 2005, Schröder 2008, Williamson 1991, 1975). This theoretical approach is of central importance in the area of the sport-media complex, as sports organizations are increasingly creating media companies, which in turn provide specific presentations of sport in a journalistic context. Accordingly, transaction costs are minimized, as market activities in production and distribution are severely restricted in order to be able to set their own media standards. The digital transformation that has already taken place means that sports organizations can produce and distribute at ever lower cost. With the increasing use of AI and greater vertical integration, it will make even more sense in terms of media economics and marketing to establish their own media structures in sports organizations.

²In contrast to neoclassical economic theory, NIE explicitly includes social and political contexts in its economic analysis and is better able to grasp crisis-prone, imperfect situations analytically (Akerlof 2005, Akerlof & Shiller 2015). It developed from the “unease of individual economists towards the frictionless neoclassical model world” (Kiefer 2005) and addresses the interconnectedness of economic and political premises in a special way, instead of thinking of them separately as in many other approaches.

Results

Actor Constellations, Information Asymmetries and the Increasing Moral Hazard in Sports Journalism

There are a number of different principal-agent relationships in journalism. On the one hand, the recipient/consumer is the principal of various agents, namely the economy (e.g., consumer goods manufacturing, advertising companies), the media and journalists. These principals commission them and expect certain products from the companies, and information, transparency, clarification, honesty, topicality and objectivity from the journalistic media and journalists, which they are supposed to produce or deliver as agents. At the same time, advertising companies and the media are principals who commission other agents: the business sector commissions the journalistic media to publish advertising and PR content and the media in turn commission journalists to create media content (Baerns 1991, Bentele 2008, Bentele et al. 1997).

The commissioning of an agent by a principal usually involves a knowledge advantage for the agent, which is either the reason for the commissioning or its result. This is because either the agent knows more from the outset, i.e. is an expert, and is hired by the principal on the basis of this additional knowledge, or the agent achieves this knowledge advantage by subsequently dealing more intensively and specifically with the topic than the principal. This information asymmetry between principal and agent can be used to the benefit or disadvantage of the principal (Akerlof 2005, 1970, Schröder 2008).

If we look at the principal-agent relationships, we must take into account that there are various pronounced information asymmetries here. The economic influence that the advertising industry can exert on the media and the media can exert on freelance and salaried journalists is disproportionately higher and, above all, more direct than that which the recipients can exert on the various players. It is also higher because the advertising market has a stronger economic position on the network market than the recipient market.

It can also be observed that there is a direct process-related communication structure between the stakeholder groups of companies, media and journalists, which can be used on the one hand to control such influence measures and on the other hand to monitor their respective success. In contrast, the information asymmetry between recipients and the other three stakeholder groups is much higher and there is no direct institutionalized communication structure. It is only possible to exert influence here very indirectly, if at all.

In the practice of sports reporting, this ultimately means that advertisers, media and journalists, each following their own economic benefit, tend to evaluate and modulate sports reporting in such a way that it is as profitable as possible - and follow the advertising market rather than the recipient market.

In this conceptual construct, alignment with legal and ethical requirements usually only takes place if this does not run counter to economic objectives or if non-compliance can (and with a certain probability will) be sanctioned (Akerlof & Shiller 2009). Transparency and information for recipients is thus only seemingly created and

only where it does not run counter to the economic interests of the various interest groups. PR and advertising interests shape reporting to a large extent in a way that is barely recognizable to recipients. Journalism is increasingly being replaced by directly or indirectly remunerated PR contributions (Baerns 1991, Bentele et al. 1997). This danger increases with digitalization, as many media experience goods have become trust goods. Real contact (primary experience) has declined sharply, while media-only contact (secondary contact) has increased. This makes it increasingly difficult to classify a lot of information (Russ-Mohl 2017).

In addition to the actual social problem of a lack of transparency and information, this leads to a further economic problem: adverse selection (Akerlof 1970, Russ-Mohl 2017). The problem for the sports reporting market is that, due to the existing information asymmetry between recipients and media/journalists, recipients cannot distinguish between good and poor quality sports reporting (in terms of neutrality, balance, criticism and transparency and thus as an information producer). In this respect, recipients/consumers tend to go for the cheapest offers, which will generally be those that are financed to a large extent by overt but also covert PR and advertising measures. As a result, poorer quality products will dominate the market because recipients will not be able to identify good quality products. As consumers cannot recognize the better quality, they are not prepared to pay more. The overall quality in the market therefore inevitably declines. This is the case in the area of information production as a service (Akerlof 1970, Akerlof 2005, Akerlof & Shiller 2015).

From a media-economic perspective, better quality only makes sense in areas where it is visible and leads to greater customer satisfaction (cf. Christensen 1997, Ferrucci & Perreault 2021). This is the case in entertainment production. Technical innovation, camera perspectives and attractive content are visible. This leads to a reduction in quality in the area of rather low transparency.

With increasing licensing fees, it can be assumed that savings will be made above all in the area of information production and in editorial structures (personnel, outsourcing, travel costs), as there is a greater lack of transparency here. Entertainment production and its price structure is therefore very likely to have a strong influence on information production. Increased savings in entertainment production are rather unlikely, as these are media experience goods with greater transparency and are particularly important economically.

In terms of media economics, it can therefore be expected that sports journalism - especially in times of crisis - will increasingly operate in moral and legal gray areas and that the aforementioned disruptions in sports journalism will be a logical consequence. It seems unlikely that media management and sports journalism will be able to remedy these problems. From the perspective of sports organizations, strategic media action is therefore of great importance.

Make Decisions as a Sports Organizational Strategy for Effective & Efficient Media and Brand Policy

The disruptions to sports journalism described above have a significant impact on sports organizations and force them to take consistent action. This necessity can be explained by the basic ideas of the attention economy concept.

The attention economy is a concept of information economics that views people's attention as a scarce commodity. From an economic perspective, attention is important for triggering an economic cycle in two respects (cf. Downs 1972, Franck 2007). In the first cycle, attention increases public attention and social prestige. Prominence and reputation are created. These entities, i.e., social manifestations, can be transformed into economic power. Once the first cycle has been realized, an economically important second cycle can be activated for sports institutions and players. In sport, publicity, awareness, prominence and reputation activate the economic sectors of ticketing, merchandising products, licenses and sponsorship through attention. It can be concluded that the more attention sports institutions and players attract, the more likely they are to be socially and economically successful. For sport, this means that it too must fight for this increasingly scarce commodity of "attention" in order to operate profitably.

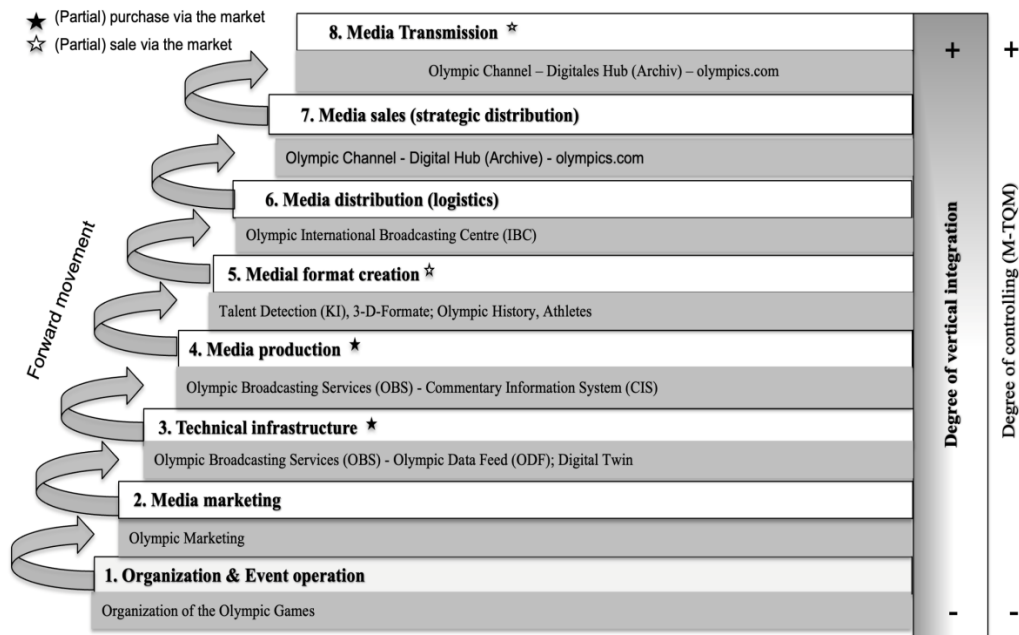
Accordingly, the media play a special role as a vehicle for attracting attention. A particularly large audience can be reached by addressing the topic in sports newsrooms. It is therefore hardly surprising that sport and its players have aligned themselves strongly with the media in many areas. Sport has laid down various "clever sugar trails", as the journalism researcher Ruß-Mohl once called them, which editorial offices are increasingly following as they too want to reach a large audience with popular content. It aligned its instruments, rhythms, arenas, players, resources, rules and variants strongly with the logic of the media - with the aim of being classified as relevant in sports editorial offices and being included in sports journalism publications (cf. Dohle & Vowe 2006). Numerous measures have been taken in recent decades in an attempt to propel sports into the media spotlight (cf. the mediatization debate Nölleke & Perreault 2023, Birkner 2017). Examples include the enlargement of table tennis balls, the shifting of competitions to prime time and new, particularly media-attractive sports such as beach handball.

With an increasing crisis in sports journalism and the associated decline in quality, such a strategy lost its meaningfulness. A lack of specialist and factual expertise, misinterpretations and overinterpretations and a severe lack of attention for the majority of sports institutions and players meant that image, awareness and brand values were increasingly at risk. In addition there is a lack of systematic media evaluation, brand controlling and media integration for strategic brand communication in both social and commercial marketing (cf. Smolianov & Aiyeku 2009). Under these conditions, it became increasingly difficult to pursue an efficient and effective brand and image policy via sports editorial offices. From the perspective of sports organizers, a solution had to be found. An adaptation according to the logic of the sports editorial offices no longer seemed to be sufficient; rather, an adaptation and further development of media structures seemed to be of great importance.

With digitalization (i.e., the switch from analogue to digital forms of communication), a new communication and brand strategy could be chosen from the turn of the millennium. Media products could be put together/combined to a greater extent, own platforms could be used/created and distributed more cost-effectively on different markets. A particularly strong degression of fixed costs could therefore be activated.

Since the turn of the millennium, in-house productions and media house concepts have been used, especially by large, globally active sports organizations, which were eventually expanded into vertical integration. Vertical integration means that “several successive value creation stages or production levels are combined in one company. The transfer of goods between these levels is not handled via the market, but is controlled within a company” (Kiefer 2002, p. 493). The structure of such a media structure can be clearly seen at the International Olympic Committee (IOC) (see Figure 2).

Figure 2. Vertical In-house Media Structure of the IOC



The diagram shows how the IOC has undertaken forward integration. The core competence of the original organizer of the Olympic Games was increasingly supplemented by media value creation stages and media structures were built up step by step, making the IOC independent of sports journalism. Several institutions have been created through which the IOC controls media production and distribution. The marketing program and brand policy are managed by “Olympic Marketing”. This includes the management and monitoring of Olympic partners, Olympic broadcasters, ticketing and licensing.

A first incisive step towards establishing media structures was securing input for content production. The founding of the Olympic Broadcasting Services (OBS), which today employs over 500 permanent staff as well as thousands of additional employees at the International Broadcasting Centre (IBC) during the Olympic Games, created almost absolute control over production. While the host nation was commissioned to provide a host broadcaster before the company was founded in May 2001, from this point onwards it was no longer simply licensed, but put together its own production team and sold the media products it produced itself on the respective TV markets.

In addition to the production of live signals, more and more media enhancement and distribution processes were integrated into the Olympic in-house production. The launch of the “Olympic News Channel” (ONC) should be highlighted here. The 24/7 news channel provides non-stop news that can be booked by rights holders without production teams on site during the Olympic Games. There is also the “Commentary Information System” (CIS) and “Olympic Data Feed” (ODF). The CIS offers various services such as data on split times, athlete biographies, start lists and results services. These services are fed with data from the ODF. The ODF ensures a uniform data structure, real-time data provision, efficiency and scalability, flexibility and accessibility.

At the reform summit in Monaco in December 2014, the IOC General Assembly also decided to install the IOC's own Olympic channel. This channel was launched in August 2016 and was fed into 200 national TV markets. IOC President Thomas Bach explains the project idea of the “Olympic Channel”, the initial implementation of which was estimated at 100 million US dollars, by saying that a platform for all Olympic sports is to be set up that broadcasts 365 days a year, 7 days a week. The IOC wants to promote the Olympic values and also show how it works with the United Nations on humanitarian issues and culture (cf. Papanikos 2024). This move to create the IOC's own TV channel and its rationale is particularly noteworthy as it further advanced the Olympic vision of a vertical media group with numerous partnership network connections. Today, the Olympic Channel is available in many formats: Live coverage and highlight clips, interviews and background reports, daily summaries and recaps, Olympic history and culture features, special reports and documentaries. A few facts illustrate just how successful these media formats are: Official Olympic social media channels have generated in Paris 2024 more than 8.5 billion engagements during the first week of the Olympic Games – 40 per cent more than the entirety of Tokyo 2020. Olympic Channel extends reach with beIN Sport launch! Olympic Channel programming is available in Middle East and North Africa, since it was extended by a cooperation within beIN Sport. 4th September, ahead of dedicated channel launch on 1st November 2018. In 2017, the channel relaunched as Olympic Channel, which continued this focus as a companion to NBCUniversal's broadcast rights to the Olympics; alongside Olympic and Paralympic sports coverage, it also carried documentaries and other programming chronicling the Olympic Games and its history, shoulder programming during the Olympics proper, and coverage of the Paralympic Games since 2018 (alongside NBCSN). In 2021, the channel aired live event coverage during the Olympics for the first time.

With such a structure, sports organizers such as the IOC can realize autonomous reporting that enables a high degree of media total quality management (M-TQM), not only in terms of product quality, but also in terms of brand policy. As the media companies buy the media products they produce themselves at enormously high prices due to a strong bidding market, it is also possible to go beyond the market in the final stages of the value chain. The product quality and brand policy can hardly suffer from this, as it is no longer a license that is being sold, but a media product. Instead, the licensee's own market promise can be disseminated by others under the guise of the respective licensee.

Discussion

This paper pointed out how the Olympic Movement has built up its own media structures and has now (cleverly) strategically positioned itself in recent years with so-called vertical media structures. It examined how the IOC has managed to make itself largely independent of sports journalistic reporting and to provide its stakeholders with high-quality reporting through its own media and public relations work, while at the same time protecting the Olympic idea/movement. The increased use of artificial intelligence in the future will most likely increase the in-house production of sports organizations. AI presents more and more opportunities for all reference groups to produce journalistic forms of presentation with technical support without having to hire staff. AI-controlled tools can already be fully automated in terms of target group approach and form of presentation. It is therefore hardly surprising that the IOC is already using AI at almost all stages of the value chain - for example, to filter and delete hate speech towards athletes, for digital room and security planning, fully automated results reporting and highlight clip payouts. It is unlikely that sports journalism will become more relevant for sports organizations in the near future. The opposite is more likely to be the case. The new communication spaces and opportunities that have emerged will make it increasingly possible to cultivate new types of communication in the future. Relationships can be established directly with the most important target and reference groups (stakeholders) and effective communication controlling (with dashboarding and KPI determination) and innovation management (with innovation labs) can be carried out. From an economic perspective, it is not (or no longer) particularly interesting for most stakeholders to connect with the nationally limited sports journalism that is editorially institutionalized in media organizations. Exclusive information can be discussed on their own platforms (owned) and/or made available to other communication partners (shared). If financially strong companies that do not come from the media sector decide to acquire rights, it is even conceivable that sports editorial offices could be excluded to a large extent in the future. Such an exclusion of sports journalism is not necessarily socially desirable. Sports journalism has an important watchdog function in our society and is therefore an important vehicle for democratic processes. It would be socially desirable for high-quality sports journalism to re-establish itself. Numerous representatives of sports organizations note this important function of sports journalism and emphasize its enormous importance. So far, however, there are few signs that high-quality sports journalism will take on a strong watchdog function in the future. Instead, it is clear that sports institutions are increasingly moving away from journalistic criticism and building their own communication worlds. The breakthrough of AI technologies seems likely to reinforce this trend.

Summary

With commercialization, sport has increasingly aligned itself with the logic of the media. In a first step, sport aligned itself with the media and thus with sports journalism. Deep rifts developed in the world of sport and a new (media) logic took

hold. Due to the lack of quality in sports journalism and the increasing possibilities offered by digitalization, the second step was to establish their own media structures. Absolutely falling costs go hand in hand with the possibility of a particularly effective and efficient brand and image policy. Modern sports management therefore increasingly requires strategic media management. Adaptation processes (in-house solutions) are increasingly being replaced by adaptations of media structures. Such vertical integrations have already emerged in globally active sports organizations. With digitalization and the associated cost reduction for media production and distribution, an expansion of such digital structures in other (also smaller) sports organizations seems very likely - AI solutions will probably play a central role in this.

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Breaking Ice: An In-depth Examination of China's Winter Sports Participation in the Wake of Beijing 2022

By Athanasios Pappous* & Jingfan Zhou[±]

Is there evidence from secondary data to suggest advancement towards Beijing 2022's objective of "Motivating 300 million individuals to engage in winter sports"? This study explored the Beijing 2022 sport participation legacy by adopting a quantitative approach with triangulation. The preliminary findings highlight the multifaceted and complex nature of evaluating the sport participation legacy goal of a Sport Mega Event (SME). The broad definition of the goal to "Motivate 300 million people to engage in winter sports," as well as the characteristics of the political mission's cultural and systemic context, were some of the factors that played an important role when trying to assess this target. Moreover, this paper revealed three crucial mechanisms transmitting the passion of winter sports from SME to mass participation legacy, through quantitatively examining the promised target. There were "Leveraging sports policy", "Provision of facilities accompanying the integration of sport and education", and "Cooperative stakeholders' alliance strengthened by media power and technology". We anticipate that this study will make a valuable contribution towards addressing the challenges posed by the broad and ambitious nature of Beijing 2022's goal, whilst facilitating further investigations on the transformative strategies.

Keywords: Winter sports participation; Impact and legacy; Beijing 2022 Winter Olympics; Social sustainability; Triangulation

Introduction

As the world turned its gaze toward the historic Beijing 2022 Winter Olympics and Paralympics, the first Olympic Games ever to implement a legacy plan adapting Olympic Agenda 2020/ New Norm and the International Olympic Committee (IOC) Legacy Strategic Approach, one goal stood at the forefront: an impressive and ambitious goal that challenged the boundaries of sport participation. Against the backdrop of a global pandemic, these Games etched their place in history, not only as a testament to human resilience but also as a harbinger of a new era in winter sports. It was here that Beijing beckoned to the world, daring 300 million individuals to embrace the thrill of ice and snow activities, setting an unprecedented milestone in the

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Olympic movement. This study centers on the assessment and achievement of this ambitious participation goal, which serves as the primary focus of our research.

The IOC Sport for All Commission Declaration underscores the shared vision of past, present, and future host cities to promote increased sports participation (IOC, 2021). Scholarly research and practical evidence suggest that hosting sport mega events (SMEs) has the potential to boost sports participation (Pappous & Hayday, 2016; Weed et al., 2015) and foster sustainable development (Hindson et al., 1994; Hogan & Norton, 2000). Within this context, the Beijing 2022 Winter Olympics and Paralympics embraced the ethos of 'Sport for All' by setting their sights on attracting 300 million people to engage in the thrills of ice and snow activities. As we delve into this study, our aim is not to definitively assess whether the "300 million" goal, which originated from the promise "Developing a winter sports market for more than 300 million people" in the bid document" (Beijing 2022 Olympic Winter Games Bid Committee, 2014), has been fully achieved, as it is an ongoing endeavor. Instead, we aim to assess the progress made towards realizing this ambitious goal and gain insights into the challenges.

Official sources now report that over 346 million Chinese people have actively engaged in winter sports since 2015 (BOCWOG et al., 2021). During IOC sessions, workshops and Observer Programs concerning legacy and sustainability, some international experts have raised questions about the precise delineation of participation in winter sports, as well as the origin and validity of the reported number of "346 million", possibly due to the limited availability of supporting literature, linguistic barriers, systemic configurations, and cultural distinctions. This numerical milestone of over 346 million people engaged in winter sports was based on the results of an official survey conducted by the General Administration of Sport of China (GAS) and the National Bureau of Statistics of China (NBS). Employing stratified random sampling, this survey involved 12,340 respondents across 31 provinces and autonomous regions in China. Its findings from 2015 to 2021 indicate that 24.56% of Chinese residents directly or indirectly engaged in winter sports (GAS, 2022). This largescale engagement involves people who practice ice and snow sports, such as athletes and coaches, but also covers the spectrum of people who indirectly engage in winter sports, such as participants in winter experiential events and the working staff of the Chinese winter sports industry (Chen et al., 2022).

Overall, the findings of this survey suggest that the Chinese winter sports market is growing, with a diverse range of contributors. While official government-commissioned surveys provided beneficial perspectives, it's essential to acknowledge the advantage of triangulation. Triangulation, a research approach that combines multiple data sources or methods, enhances the reliability and validity of findings. Therefore, in complementing the official survey results with a wide range of secondary data, this study aims to offer a more comprehensive and nuanced understanding of the complex landscape of winter sports engagement in China.

Moreover, future editions of the Games such as Milan-Cortina 2026 envisioned "Games for All" also emphasize sport participation, in light of the same Olympic sustainable strategy and legacy framework. Attempting to inspire the legacy planning and execution of future winter SME globally and contributing to the further development of the scaling up Chinese winter sports industry, we engaged in

triangulation to inspect the facts and evidence of whether a sports participation legacy was delivered by Beijing 2022.

The mainstream literature suggests that additional indicators and longitudinal data are necessary to empower researchers to examine the sport participation legacy of major sporting events. Regarding the research gap, this study is guided by the research question of whether there are facts and evidence suggesting the advancement towards Beijing 2022's objective of motivating 300 million individuals to engage in winter sports. We then select additional indicators, which reflect annual fluctuations in winter sports participation, from people, facility/equipment, and market perspectives. Examining these indicators not only facilitates international observers in studying the sustainability and legacy of Beijing 2022 in detail but also provides references to researchers conducting international comparison studies to bridge the gaps corresponding to knowledge transfer.

Literature Review

The Definition of Winter Sports Participation in Prior Investigations

The definition of sport participation in prior investigations has varied, often based on the context of grassroots sports, where physical activity and engagement by ordinary people are monitored. Some studies have not distinguished between random and regular sport participation (Scheerder et al., 2011), with random participation referring to joining sports festivals or events (Gau et al., 2022) and regular participation referring to committing to physical training and sports education (Wicker et al., 2013). Other investigations have identified sport participation with physical activity engagement during the previous four weeks (England, 2022), while many investigations have operationalized a more precise quantitative concept, such as the proportion of adults aged 16 or older who engaged in sports at moderate intensity for 30 minutes or more at least once in the past week (Sports Science Research Center, 2022). Additionally, the sport participation concept has referred to both mass and elite sports participation in some contexts, and different age criteria or discipline-specific definitions have been suggested in other studies (Breuer et al., 2011; Downward & Riordan, 2007; Humphreys & Ruseski, 2009; Leslie et al., 2004). In the context of winter sports, there needs to be an explicit definition and clear indicators to measure the winter sports participation.

Preceding Work on Sports Participation Legacy

The current body of literature on sports participation at international SMEs is at a developing stage where there were 6 preceding literature reviews providing periodical evidence for a cluster of research questions, and the mainstream research focus was on the efficiency and effectiveness of the leverage policies. Within the limited and focused research interest in the social science area, which typically includes education, training, destination branding, volunteering, etc. (Mair & Smith, 2021), we identified a pattern of addressing the public participation legacy of London 2012 OG and PLG

with multiple attempts to develop gold standard theories and research frameworks to inspire future generations.

Besides, the selected literature in the social science area demonstrated interdisciplinary characteristics penetrating medicine, administrative management, and business management branches. Based on the PRISMA-ScR paradigm, we carefully examined 62 peer-reviewed journal articles, coming from preceding works. Based on the characteristics of the selected investigations, we divided the samples in the final corpus into 3 groups based on the events' features and motivations: (1) Case study of Olympic Games and Paralympics, (2) Non-Olympic Games case study or comparison study focusing on practice, and (3) Theory development-centric study.

The majority of previous investigations have focused on examining whether the host nations have successfully increased physical activity participation through hosting international SMEs (Shi & Bairner, 2022), such as the Summer and Winter Olympics, Paralympic Games, and World Cup. A small number of researchers, represented by Kim & Kaplanidou (2024) and Ribeiro et al. (2022), discussed how would sports participation benefit international sporting success. At the same time, it is worth noticing that research on the legacy creation mechanism and delivery process has gained popularity in the past decades. In many cases, governments use the 'demonstration effect' or 'trickle-down effect' to promote physical activities and improve national brands (Hindson et al., 1994; Weed et al., 2015). By contrast, the autonomous approach has been suggested by a group of pioneering scholars, for example, Brown, Gérard, and Pappous (2019).

Regarding the various attempts and needs to figure out a path leading to the sustainability, we carefully inspect the research paradigm, methods, and essential outputs of the preceding academic works in each group. The analysis results highlight the scarcity of empirical studies with mixed research methods while revealing a need for further research to fully understand sports participation in different contexts.

In general, we identified critical research gaps in scrutinizing the sports participation legacy and its delivery process of the latest three Olympics held in Asia. Moreover, the limited application of theoretical paradigms indicates a need for more continuous studies after the Games with international comparative frameworks to examine sports participation, targeting establishing gold stand theories and protocols for social sustainability.

The Juguo System

The Chinese sports system, referred to as "Juguo Tizhi" (举国体制), has a rich history and a complex framework. It is characterized by a top-down approach, with the government playing a leading role in identifying, training, and supporting elite athletes. The system has been influenced by the Soviet-style sports system and has undergone significant reforms since the 1980s. The evolution of the system reflects changes in sports philosophy as well as shifts in societal priorities. Initially, at the establishment of the People's Republic of China (PRC), the primary focus of sports was to enhance and optimize national self-esteem and contribute to civil defense efforts.

The "Juguo Tizhi" is composed of three layers based on geographical and administrative features. From the administration perspective, the three layers are GAS,

Provincial Sport Administrations, and Urban/Prefectural Sport Administrations. From the dimension of sports teams, the three layers are the National teams, Provincial teams, and Urban/ Prefectural teams. The fundamental structure of the Three-Layer Sports Administration System has remained remarkably consistent throughout modern Chinese history. GAS serves as the overarching body, responsible for formulating sports strategies and policies in alignment with the nation's economic and social development plans. It creates guidelines, allocates resources, and oversees the execution of sports-related activities. The national teams select and develop top-level athletes with guidance and all-around support from GAS. The Provincial Sport Administrations, funded by local government, execute the tasks assigned by GAS, and support the operation of provincial teams. Meanwhile, they take responsibility for developing detailed plans with specific conditions of the region, distributing resources based on the rules, and supervising the third-layer subordinate organizations.

The Chinese Winter Sports Federation (CWSF) emerged as the apex association overseeing all winter sports within the GAS system. This formal structure pointed to the importance of coordinating and regulating winter sports activities across the country. Prior to the successful bid for Beijing 2022, only a few selected Provincial, Urban, and Prefectural Sport Administrations were entrusted with the development of both winter and summer sports. This allocation of duties significantly influenced the distribution of resources and the prioritization of sports development in specific regions, such as Hei Longjiang, Jilin, Liaoning, Beijing, Hebei, Neimeng, Jiangsu, Guangdong, and Xinjiang.

GAS, joined by the Chinese Ministry of Education, National Development and Reform Commission (NDRC), and the Ministry of Finance developed strategies and programs to advance China's standing in winter sports on a global scale at both elite and mass sports level. Divergent stakeholders managed to integrate their own interests into the government-commissioned plans from the pre-Game stage to the after-Game period. The Beijing Organizing Committee for the Winter Olympic Games (BOCWOG), working in collaboration with schools, universities, local governments, and commercial organizations builds various types of talents for the promotion of winter sports. Beyond the realm of medal-winning winter sports disciplines such as figure skating, short-track speed skating, and speed skating, we have observed a significant transformation in the popularity of ice hockey, skiing, and snowboarding. The implementation of a series of strategies and programs, including "promoting ice and snow sports from north to south, east and west", "promoting ice and snow sports on campuses" and so on (GAS, 2016), contributed to the achievement in the sports involvement domain (BOCWOG et al., 2021).

Methods

Overview

This study aimed to achieve a triangulation perspective by examining a wide variety of quantitative indicators, including secondary data from 2015 to 2021, the official timeframe for the winter sports participation legacy. The sources for this study

include publicly available quantitative data related to sports participation before and after Beijing 2022. These data sources encompass government reports, official event records, surveys conducted by relevant sporting organizations, and market reports from companies or non-profit institutions. Moreover, Baidu index, which is an effective tool similar to Google Trend for trend analysis indicating changes in information query behavior through search volume at the Chinese popular search engine "Baidu", has been engaged to examine Chinese internet users' interests in winter sports. We aimed to include data that would reflect changes over those 7 years, to provide a comprehensive analysis of any potential changes in sport participation levels.

Data Collection

The cumulative data from the telephone survey conducted by GAS and NBS does not depict the changes during the seven years. Therefore, we collected longitudinal data from the official website and policy documents of GAS and CWSF, the Olympic World Library, the IOC official website, NBS, International winter sports industry reports, Statista, and other confidential resources.

Data Selection and Analysis

Several indicators that directly or indirectly reflect winter sports participation were selected. These indicators were selected based on the following criteria:

- **Relevance:** The indicators must be relevant to the research question, which is to examine the impact of the Beijing 2022 Winter Olympics on winter sports participation in China.
- **Availability:** The indicators must be available from 2015 to 2021, the same period as that of the official survey.
- **Reliability:** The indicators must be valid measures of winter sports participation.

For data analysis, we independently examined each category of variables and performed descriptive analysis. Then, we examined China's crucial facilitators and featured sports to achieve the "300 Million" goal.

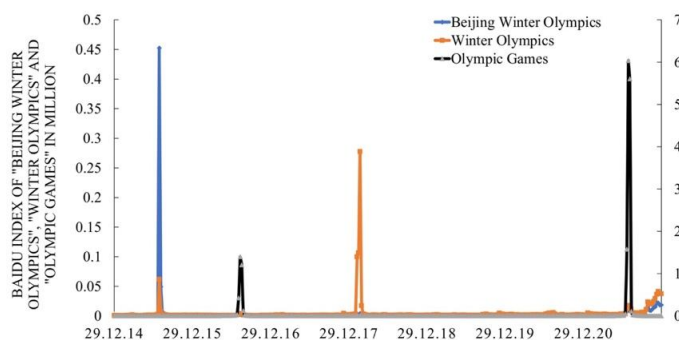
Results

Dynamics of Winter Sports in China

Figure 1 demonstrates the change in Chinese internet users' interest in Beijing 2022, the Winter Olympics, and the Olympic Games in general during the preparation for Beijing 2022. The peak search volume of the Beijing 2022 Winter Olympics appeared in July 2015, one year after Beijing won the bids. And the next rise started in July 2021, 7 months ahead of the hosting of Beijing 2022. Meanwhile, the peak search volume for the Winter Olympics emerged in February 2018 when the PyeongChang

2018 Winter Olympics were held by South Korea, and the Tokyo 2020 Olympics, which started in July 2021, created a boom in the search for the Olympic Games in Baidu. In contrast, our results show lowest search volumes in all the 3 keywords in January and February 2015. The average search volume (per week) was around 3000 for Beijing 2022 in the Pre-Game phase, around 4300 for the Winter Olympics, and more than 47000 for the Olympic Games.

Figure 1. Search Volume of Beijing 2022, Winter Olympics and Olympics from 2015 to 2021

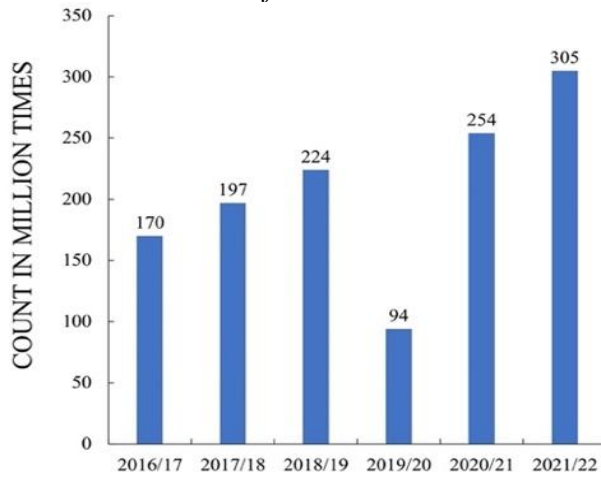


Winter sports not only attracted Chinese internet users but also those who took action to embrace the joy of ice and snow sports activities, although the online tendency doesn't always correlate to sports participation behaviors. According to the ice and snow industry reports and popular Chinese news media, the number of site visits (in some literacy written as the number of winter tourists) reflects the development of ice and snow sports industry, facilitating winter sports participation. Figure 2 shows that the number of visits to ski resorts and ice rinks in China generally increased from the 2016/17 season to the 2021/22 season. However, there was a sharp drop of 49.27% in visits from the 2018/19 season to the 2019/20 season due to COVID-19 and related policies (Worldbank, 2021). From the 2019/20 season to the 2020/21 season, the number of visits increased from 94 million to 254 million, representing a pre-Games increase of 170.21%.

From the dimension of sports discipline, the medal winning disciplines such as figure skating (23.23%), short track speed skating (13.31%) and curling (19.63%) received the most attention. While ice hockey (12.89%), luge (8.31%) and snowboard (7.24%) caught eyes of Chinese netizens according to the historical Baidu Index from the beginning of 2015 to the end of 2021 (see Figure 3).

Besides, online stakeholders in different regions voluntarily respond to Chinese winter sports promotion strategies and programs, such as "promoting ice and snow sports from north to south, east and west". Figure 4 displays the geographic distribution of Chinese winter sports enthusiasts corresponding to their information query behaviors. Beijing, Guangdong, and Jiangsu provinces ranked in the top 3 in the search volume of Beijing 2022 WOG from 2015 to 2021. In contrast, OG attracted many Chinese netizens from Guangdong, Zhejiang, and Jiangsu, 3 non-hosting provinces with high-speed economic and social development in China.

Figure 2. Total Number of Visits to Ski Resorts and Ice Rinks in China (in millions)



Note. Each season is divided based on the fiscal year of Chinese ice and snow sports industry, which begins from 01. May of the same year and ends on 30. Apr. the next year.

Source: Forward the Economist (Forward the Economist, 2022).

Figure 3. Baidu Index per Winter Sports Discipline from 2015 to 2021

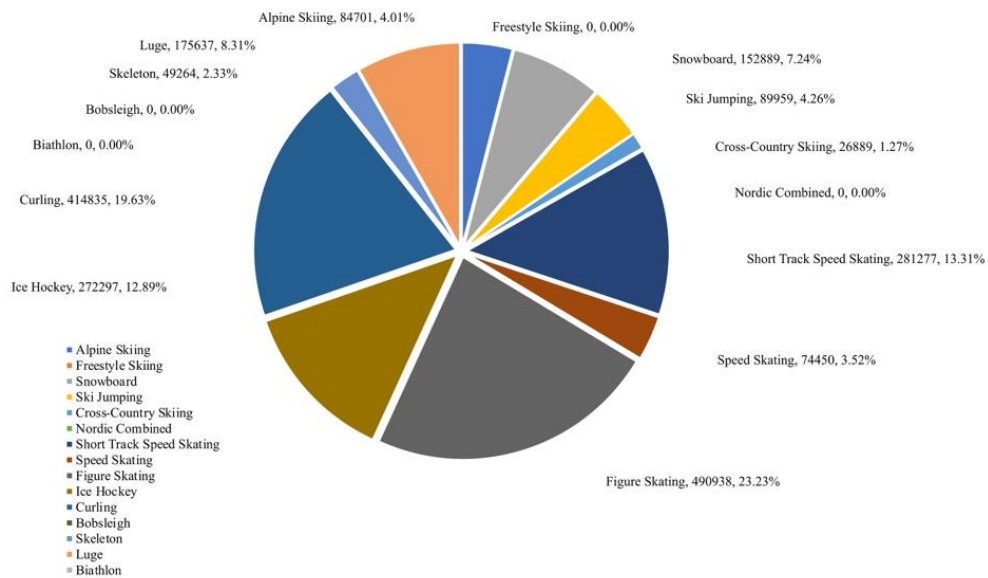
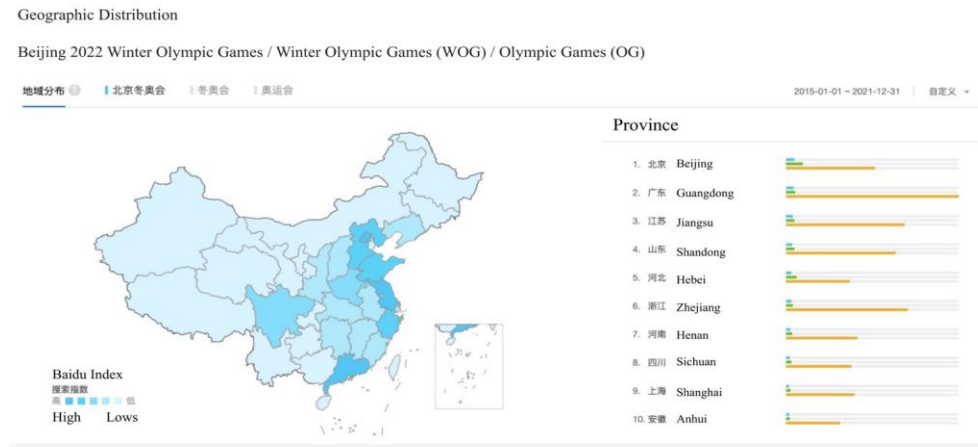


Figure 4. Geographic Distributions of Chinese Winter Sports Enthusiasts in the Pre-Games Phase

In the process of expanding the scale of winter sports from north to south, China reported that the combination of training and education has been another critical enabler of Chinese winter sports participation (BOCWOG & Beijing Sports University, 2022). Table 1 depicts that the number of skiers and children participating in ice and snow sports training was higher in the 2020/21 season than in the 2014/15 season. In the 2014/15 season, 11.95 million Chinese people (8.57% of China's total population; United Nations, n.d.) participated in skiing activities. This number reached 20.76 million in the 2020/21 season, accounting for 14.56% of the Chinese population. The maximum penetration rate was found in the 2020/21 season, after the sudden drop in the 2019/20 season, which saw a loss of 10.45 million skiers.

Table 1. Total Number of Participants in Different Types of Ice and Snow Sports in China

Season	Total Number of Skiers in China	Total Number of Chinese Kids Participating in Ice and Snow Sports` Training	Total Number of Youth Ice Hockey Players in Beijing
2014/15	11'950'000	2'410'000	1'205
2015/16	14'450'000	2'460'000	1'545
2016/17	16'900'000	2'540'000	2'350
2017/18	19'150'000	2'630'000	2'619
2018/19	20'600'000	2'700'000	3'308
2019/20	10'450'000	2'740'000	3'701
2020/21	20'760'000	2'780'000	3'127

Note. Each season is divided based on the fiscal year of Chinese ice and snow sports industry, which begins from 1. May of the same year and ends on 30. Apr. the next year.

Source: Statista (W. Zhang, 2023), Legacy Case Studies (BOCWOG & Beijing Sports University, 2022) and Forward the Economist (Forward the Economist, 2022).

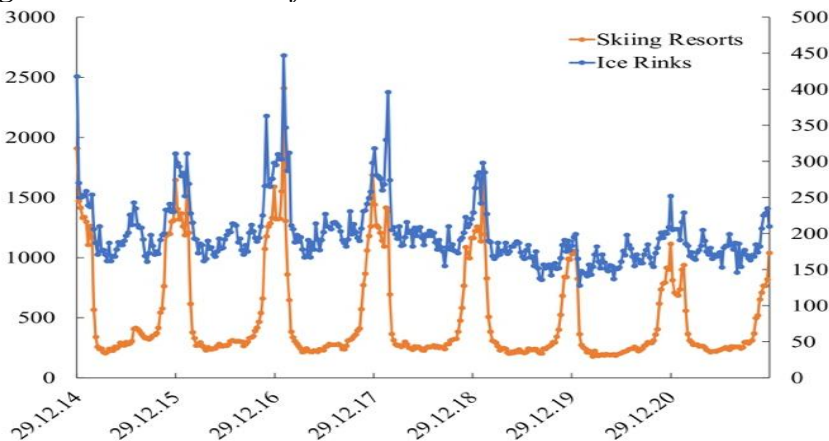
In contrast to the number of skiers, the number of Chinese children participating in ice and snow sports training increased steadily from 2.41 million in the 2014/15 season to 2.78 million in the 2020/21 season. The penetration rate followed the same trend, increasing from 1.73% to 1.95% of the Chinese population (United Nations, n.d.). The ice and snow sports training market for Chinese children grew relatively rapidly in the 2015/16 and 2016/17 seasons, with an average annual growth rate of 3.40%. However, the market growth slowed down from the 2018/19 season to the 2020/21 season.

In addition to skiing, the promotion of youth ice hockey has been seen as a significant achievement in sports participation. In the 2014/15 season, the number of youth ice hockey players in Beijing reached a record high of 1205. This number continued to rise and tripled by the 2019/20 season. After a sudden drop in the 2020/21 season, Beijing youth ice hockey continued to grow and evolve (BOCWOG & Beijing Sports University, 2022). Furthermore, the results also show the growth of children participating in ice and snow sports training across China is related to the expansion of youth ice hockey in Beijing.

Facilities & Equipment

Figure 5 displays the pattern of Chinese netizens' behavior change in terms of searching ice rinks and skiing resorts. From 2015 to 2021, the high volume of searching appears in the period starting from October the previous year to February the following year. Compare with ice rinks, Chinese netizens paid less attention to skiing resorts, where seasonal volatile is more obvious. And the gaps between ice rinks and skiing resorts remain at the same level in the pre-Game period.

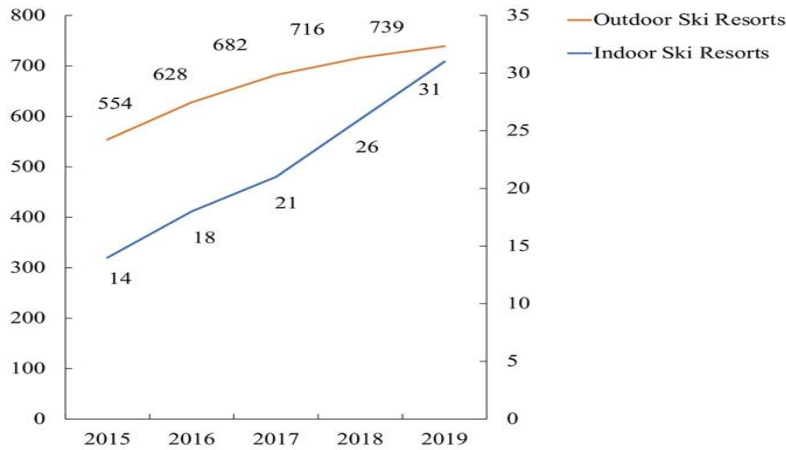
Figure 5. *Search Volume of Ice Rinks and Snow Resorts in Baidu*



By 2022, the number of ice skating venues and skiing fields in China had reached 2,261 (W. Zhang, 2023), 2.23 times more than that in 2015. Although annual statistics on all ice and snow sports venues in China are not available, the data we collected shows that the number of ski resorts increased from 568 in the 2015 season to 770 in the 2019 season. The growing tendency of indoor and outdoor ski resorts are similar.

The average growth rate of indoor ski resorts was 22.07%, and the average growth rate of outdoor ski resorts was 7.54% (see Figure 6).

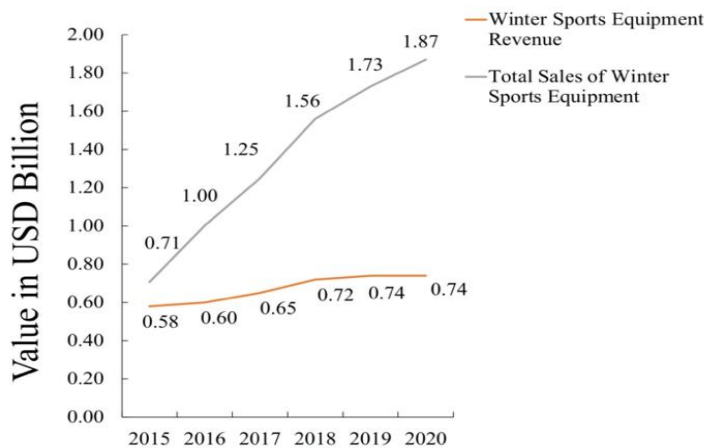
Figure 6. Number of Outdoor and Indoor Ski Resorts in China from 2015 to 2019



Source: Forward the Economist (Forward the Economist, 2022).

From a winter sports equipment perspective, our analysis results showed that the gap between total sales and revenue widened each year from 2015 to 2020. The winter sports equipment market expanded, but the growth rate slowed down after 2017. Meanwhile, revenue from winter sports equipment grew marginally from 2015 to 2020 (see Figure 7). There is a strong positive correlation between total sales and revenue of winter sports equipment.

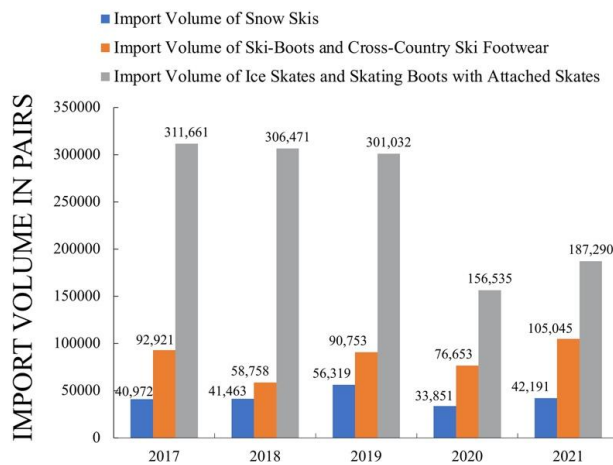
Figure 7. Total Sales and Revenue of Winter Sports Equipment in China from 2015 to 2020



To compare the growth of ice and snow sports, we examined the volatile changes in the import volume of skis, ski footwear, and ice skates from 2017 to 2021. Despite the decrease in 2020, the import volume of ice skates and skating boots was higher than that of snow skis and boots. In contrast, the import volume of snow skis and

boots showed an increasing trend with volatility (see Figure 8). However, the enlargements of the import volume are not correlated, judging from the graphic.

Figure 8. *Import Volume of Skis and Ice Skates in China from 2017 to 2021*



Source: Statista (W. Zhang, 2023).

4.1 Market Power of the Chinese Winter Sports Industry

Based on government policies and plans, the Chinese winter sports market covers three sectors: design and equipment, operation and services, and final consumption (Interesse, 2023). The market size is calculated by the total sales of all three sectors related to winter sports activities.

In 2015, the total sales of Chinese winter sports were CNY 27 billion. This number reached CNY 48.75 billion in 2019, but fell to CNY 44.52 billion in 2020 due to the impact of COVID-19. The skiing industry has shown similar growth trends. The market size of the Chinese skiing industry includes operating income, sales of skiing clothing and equipment, investment in ski resort construction, and investment in skiing training (MobTech, 2020). In 2015, the market size was CNY 12.75 billion. After hitting a record of CNY 26.75 billion in 2019, the total sales dropped 16.86% in 2020.

Winter sports training and competitions/events have had a clear leveraging effect in motivating more Chinese people to participate in winter sports, according to IOC legacy reports. The skiing training market witnessed rapid growth from 2015 to 2020. In 2015, the size of the skiing training market was CNY 5.01 billion, which had increased by 1.38 times by 2020 (see Figure 9). Moreover, the results also confirmed that skiing training and skiing competitions/events advanced the Chinese skiing industry and created one of the world's largest beginner markets.

Regarding the leverage effects of popular Chinese winter sports events, Table 2 reveals that the amounts of events within the flagship program "National Public Ice and Snow Season" increased in general, despite the collision of the COVID-19 pandemic. From 2015 to 2021, over 1,000 competitions and events were organized annually. These events, exemplified by names such as the "National Public Ice and Snow Season," "Red Bull Nanshan Open," and "Harbin Ice Festival," attracted nearly

100 million individuals, both directly and indirectly, into the fold of winter sports (BOCWOG & Beijing Sports University, 2022).

Figure 9. *The Market Growth of Chinese Winter Sports from 2015 to 2020*



Source: Statista (W. Zhang, 2023).

Table 2. *Details of Chinese National Public Ice and Snow Season*

Year	Place of Launching Ceremony	Number of Events Held	Number of Provinces, Autonomous Regions and Municipalities Involved	Number of Participants	
1st	2014	Beijing	80	10	Around 10 million
2nd	2015	Beijing	100+	15	Around 15 million
3rd	2016	Beijing	100+	25	30 million
4th	2017	Shijiazhuang	1,000+	25	50 million
5th	2018	Shanghai	1,500+	27	90 million
6th	2019	Tianjin	800	27	70 million
			(most planned events were not held due to the pandemic)		
7th	2020	Changchun	1,200	31	Nearly 100 million
			(less events were held due to the pandemic)		

Source: Legacy case studies: Olympic and Paralympic Winter Games Beijing 2022 (BOCWOG & Beijing Sports University, 2022).

Discussion

The Leverage Effects of Sports Policy and Economic Progression

The findings presented in this paper provide preliminary evidence that Beijing 2022 has played a pivotal role in increasing the engagement of the host population in winter sports participation in the period leading to the Games. The Baidu index revealed that most Chinese pay great attention to the Olympic Games at game time, partially confirming the demonstration effect of elite sports events in China. Moreover, both our data and Beijing 2022 Pre-Games Sustainability Report highlighted that in the period 2015-2021 mass participation in winter sports flourished. Chinese winter sports participation widened considerably from 2016 to 2018, while another fast growth appeared one year ahead of the 2022 Beijing Games. Although attitude and behavior changes are often intertwined, our results haven't demonstrated a significant correlation between the search volume and the visits to ice rinks and skiing resorts in China.

Regarding the geographic location of Chinese netizens who searched for ice rinks and skiing resorts, we diagnosed that there was a high percentage of people coming from the provinces with economic progression, such as Jiangsu, Shandong, and Zhejiang besides those provinces appointed with winter sports development tasks, for instance, Beijing, Guangdong, and Hebei. Meanwhile, some traditional winter sports provinces, for example, Hei Longjiang, Jilin, and Liaoning reported a great number of winter sports participation, whilst holding a relatively low Baidu index. From the dimension of winter sports discipline, our results revealed that medal-winning disciplines and popular sports, such as skiing and snowboarding, drew lots of attention from Chinese internet users. The demonstration effect of elite sports success could be one of the reasons. Other factors may involve social identity, exclusivity, learning enthusiasm, and so on. Referring to sports policies and the relevant guidelines, such as the Ice and Snow Sports Development Plan 2016-2025 and the Mass Winter Sports Promotion and Popularization Plan 2016-2020 (Interesse, 2023) that served as a solid foundation for the growth of winter sports in China, we diagnosed multi-level and purposive policy-driven features of the increment. This positive outcome can be attributed to a multifaceted approach that combines effective policy strategies and targeted initiatives.

Moreover, the disconnection between attitude and behavior changes may be attributed to the Chinese sports system, consumption habits, and diverse models of Chinese winter sports development in the selected region. Corresponding to the "Juguo Tizhi" characterized by the "Top-down" mechanism, the "bottom-up" approach stimulated facilities development, talent identification, and social advancement in the non-traditional winter sports regions.

Provision of Facilities Accompanying the Integration of Sport and Education

Our results strengthened the argument that sports education and training emerged as a critical factor in fostering a culture of winter sports participation among the younger generation. This integration extends beyond theoretical classroom sessions, encompassing practical hands-on experiences. Elementary, middle, and high schools

acted as beacons for young talents' development. Universities have played a determining role in popularizing winter sports and fostering sustainable development by nurturing winter sports instructors, basic-level trainers, volunteers, and various other types of talent essential to the sport. The resulting program has laid the foundation for a sustainable, cyclical winter sports heuristic system, whose resilience has been exemplified amidst the challenges posed by the COVID-19 pandemic.

This promotion strategy is a tangible element of the broader social context that influences individuals' understanding and engagement with winter sports, aligning with the artifactual layer's focus on formal structures and policies by integrating winter sports into the curriculum and offering accessible training opportunities, this approach not only introduced a vast number of students to winter sports but also ensured their continued involvement beyond the Games.

Accompanying the soft-power building program, the proliferation of winter sports facilities nationwide has played a pivotal role in popularizing ice and snow sports in China. From 2015 to 2022, the number of ice and snow sports venues increased by 1.43 times. Notably, our results demonstrate a significant difference in the growth of outdoor and indoor ski resorts. And the winter sports participation rate largely depends on the geographical distribution of the venues, in terms of southern-northern China (GAS, 2022). Furthermore, our research has established clear reciprocity between the growth in the number of Chinese children participating in ice and snow sports training and the rapid construction of ski resorts, regardless of their types.

Given its substantial infrastructure requirements, skiing was less prevalent in many regions of China compared to ice sports. As a result, ice rinks attracted more public attention than skiing resorts in general, and the expansion of ski resorts emerged as a sensitive indicator to gauge market trends. Our findings reveal that the growth in the number of ski resorts reached its peak (exceeding 10%) between 2015 and 2016, driven by winter sports-friendly policies and a surge in participation. While outdoor ski resorts remained predominant in China, the development of indoor ski resorts has been instrumental, particularly in non-traditional winter sports provinces and cities lacking natural snow, in fulfilling sports policy objectives and realizing participation goals.

Besides government policies and cultural factors, conditional change (such as increasing health consciousness triggered by the COVID-19 pandemic) contributes to the extension of mass participation and influences consumption behaviors. The successful bid for Beijing 2022 initially prompted a surge in the import of ice and snow sports equipment. The fluctuation in the import volume of items such as skis, ski footwear, and ice skates reflects customer preferences for ice and snow sports equipment with foreign brand names. The rise of Chinese domestic products and advancements in related technologies have reshaped the market landscape and altered revenue distribution. Furthermore, the rapid rebound observed after 2020 could be linked to two driving factors within the Chinese winter sports industry—first, the phenomenon of "revenge consumption," (Hong & Oh, 2021) which signifies rapid economic progress driven by psychological and emotional factors following a period of stagnation consumption, and second, government-led initiatives in the market.

The Vast Novice Sports Market and Stakeholder Alliance

The growth of participants per year in different ice and snow sports and the increase in the market for Chinese winter sports indicate that China is becoming a vast novice winter sports market. From 2015 to 2021, the amounts of visits doubled while the size of the Chinese winter sports industry grew 181%. The speed of augmentation attracted lots of queries about the number and mechanisms.

Referring to the official legacy report, the stakeholders involved in Beijing 2022, including BOCWOG, host governments, sports organizations, media and social media outlets, a wide array of sponsors and suppliers from different sectors, and local communities (Ferkins & Shilbury, 2015; Naraine et al., 2016; Oh et al., 2018), managed to collaborate closely with a shared vision: 'Motivate 300 million people in winter sports' (Beijing 2022 Olympic Winter Games Bid Committee, 2014). This collaborative mechanism can be delineated as a multi-centric network, underpinned by the principle of equal stakeholder responsibilities and rights (Q. Zhang et al., 2023). Besides the formal structure, the autonomous collaboration among stakeholders often took place through various training programs, and the hosting of events and competitions, infused with the cultural values and beliefs of local communities.

Our results suggested that government policies and formal structures have a great impact on shaping the collaborative landscape and creating an effective mechanism to balance organizational interests and demands. However, there's still limited information about whether the collaborative efforts among stakeholders encountered challenges in conjunction with goal alignment, strategies, and specific tactics (Chalip et al., 2017), as well as with which methods Chinese organizers resolved the conflicts.

Limitations and Directions for Future Research

In assessing the promise to engage 300 million people in winter sports through the Beijing 2022 Winter Games, our study analysed a wide range of secondary quantitative data. This approach offered several advantages and limitations. Utilizing secondary data allowed us to access a wealth of information on participation rates, infrastructure facilities development, and government initiatives, enabling a comprehensive evaluation. It also facilitated the analysis of trends and changes over a seventh time period, which provided insights into the effectiveness of various strategies employed. However, the use of secondary data poses challenges, including different conceptualizations, potential data quality issues, inconsistencies across sources, and the inability to capture nuanced aspects of individual experiences. Furthermore, establishing causality in our study remains a challenge, despite that the validity and reliability of the official data provided by the Chinese government and the selected research institutes/commercial organizations are interdependent, convergent, and complementary.

While the Beijing 2022 Winter Games undoubtedly played a significant role in promoting winter sports, numerous confounding factors could influence participation rates. Socioeconomic variables, regional disparities, cultural preferences, and the presence of other sporting events or initiatives could all impact engagement in winter sports. Additionally, our study focused mainly on the phase leading up to the Games

and this makes it difficult to ascertain the long-term effects. This temporal lag between the event and the realization of its impact legacy makes it challenging to assess the effectiveness of initiatives aimed at promoting a durable sports engagement. To address these complexities, future research should incorporate qualitative data and conduct in-depth interviews or surveys to gain a deeper understanding of individuals' motivations and experiences, thereby shedding more light on the cultural and societal factors that might have played a crucial role in shaping sport participation patterns.

Conclusion and Practical Applications

This paper represents one of the pioneering studies that has undertaken a comprehensive and extensive analysis of a carefully selected set of quantitative indicators in alignment with triangulation. Meanwhile, this investigation provided references to understand the complex nature of winter sports participation legacy. Our objective has been to shed light on various dimensions, including the perspectives of individuals, facilities, equipment, and the market, to closely monitor progress toward the targeted sport participation goal. We anticipate that this study will make a valuable contribution towards addressing the challenges posed by the broad and ambitious nature of Beijing 2022's goal, which seeks to inspire 300 million people to engage in winter sports.

In our pursuit of a suitable methodology to bridge the existing research gap in assessing the achievement of engaging 300 million Chinese in winter sports, which has been treated as a numerical target by a substantial proportion of scholars, our study has contributed significantly by employing a wide array of indicators and comprehensive longitudinal data. The secondary data originate from both national and international sources, including reputable organizations such as BOCWOG, IOC, and GAS. In addition, it should be noted that our study not only includes data from sources that can be considerably challenging for Western academics to access, as they are primarily rooted in the Chinese language or domain. Thus, this research endeavor has yielded critical insights, not only shedding light on the success of the sport participation legacy but also serving as a source of inspiration for future investigations on a global scale into the strategic planning and implementation of legacy programs and their facilitators. Regarding transformative strategies, our study has identified three crucial mechanisms that stakeholders leveraged to realize the sport participation goal. These mechanisms include "Leveraging sports policy", "Provision of facilities accompanying the integration of sport and education", and "Cooperative stakeholders' alliance strengthened by media power and technology".

In conclusion, our comprehensive investigation highlights that evaluating the legacy of the Beijing Winter Olympics necessitates an understanding of systemic context, culture norms and methodologies. It is worth further investigation to assess if the transformative strategies are acquisitive and could maintain the sport participation legacies after the Games.

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No potential conflict of interest was reported by the author(s). And there is non-financial interest that has arisen from the direct applications of your research.

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Data Availability Statement

The data presented in this study is available on request from the corresponding author.

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