

SERIES: SOCIOLOGY

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RANKING JOURNALS IN SOCIOLOGY, EDUCATION AND PUBLIC ADMINISTRATION BY SOCIAL CHOICE THEORY METHODS⁵

Abstract: An analysis of journals' rankings based on five commonly used bibliometric indicators (impact factor, article influence score, SNIP, SJR and h-index) has been conducted. It is shown that despite the high correlation, these single indicator-based rankings are not identical. Therefore, new approach to ranking academic journals is proposed based on the aggregation of single bibliometric indicators using several ordinal aggregation procedures. In particular, we use the threshold procedure, which allows to reduce opportunities for manipulations.

JEL Classification: C71, D71.

Keywords: bibliometrics, journal rankings, ordinal aggregation procedures, threshold procedure.

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1. Introduction

Scientific information is published in academic journals, which are playing an increasingly important role in covering the innovations in academic community. Moreover, the number of journals is growing very fast. Journals rankings have gained more interest, visibility and importance recently. The debates over the use and abuse of journal rankings are heated and have recently heightened in their intensity. For the evaluation of journal's scientific significance, various indices are used. For these and other reasons, several indicators, such as impact factor, Hirsch index, SNIP and others, had been proposed to evaluate the various qualities and merits of individual journals. Based on these indicators we obtain different rankings, which do not fully coincide.

Detailed descriptions of these indices can be found in Rousseau (2002), Glänzel, Moed (2002) Pislakov (2007). Furthermore, it was recently understood that the use of single factor to rank scientific journals does not give comprehensive view on the quality of the journals. Therefore, several studies have been performed to construct more complex indices evaluating journals. For example, in [Aleskerov et al., 2011, Aleskerov et al., 2014] several aggregation methods, such as the Copeland rule, the Markov ranking, the uncovered set and the minimal externally stable set, have been used. A.-W. Harzing and J. Mingers [Harzing, A.-W., Mingers J., 2007] investigated relationships between the different rankings, including those between peer rankings and citation behaviour and developed a ranking based on four groups. The purpose of that paper was to present a journal ranking for business and management based on a statistical analysis of the Harzing dataset. In [Fisher J. et al., 2007] a ranking list of journals for the information systems and decision-making is presented. The analysis of journal rankings including several indices had been made.

Indeed, there is no sufficient reason to presume that any simple indicator is somehow inferior to others. Ranking based on only one bibliometric indicator may not fully reflect the quality and significance of an academic journal due to the complexity and multidimensionality of these objects. In addition, single-indicator-based rankings give more opportunities for journal editors to manipulate. For example, according to [Epstein D., 2007], the impact factor, which is the most popular and commonly used citation indicator, is incredibly easy to manipulate. There are several ways to do it, e.g. self-citation, review articles, increasing non-citable items in the journal and others.

In this paper, we use such procedures, which reduce opportunities for manipulations. This means that it is impossible to compensate for low values of some citation indicators by high values of the others.

The key purpose of our paper is to construct consensus rankings of journals in education, public administration and sociology based on the social choice procedures, applied to the problem of multi-criteria evaluation, and on the theory of the threshold aggregation developed in [Aleskerov et al., 2010a, 2010b] and applied, in particular, to authors' evaluation in [Aleskerov et al., 2013a].

- We evaluate the degree of consistency between the bibliometric indicators (impact factor, article influence score, SNIP, SJR and h-index) for each set of journals separately,
- Construct aggregate rankings using the threshold procedure and other aggregation procedures, such as Hare's Procedure, Borda's rule, Black's procedure, Nanson's procedure, Copeland's rules, Simpson's procedure, Threshold procedure and Markovian method.
- We found that the ranking constructed is more effective tool in evaluation of journal influence than the ranking based on the value of one individual index.

The approach we use evaluates journals according to a set of criteria, which, in our case, consists of impact factor, article influence score, SNIP, SJR and H-index.

The text is organized as follows. In Section 2, we provide the definitions of the used bibliometric indicators. Section 3 contains description of the empirical data and the correlation analysis of single-indicator-based rankings. In Section 4, the threshold procedure and other ordinal ranking methods are formally described. Section 5 presents the analysis of the obtained aggregated rankings. The summary of the results is given in the Conclusion. Appendix 1 contains the ranks of journals in single-indicator-based and aggregate rankings. In Appendix 2, the journals excluded from the analysis are listed.

2. Bibliometric indicators

We will give brief definitions of several measures of journals citedness that are used in this study.

2.1. The impact factor

The impact factor (IF), first introduced in [Garfield and Sher, 1963], is the most popular and commonly used journal citation indicator. It shows the average number of citations to the published paper in a particular journal. In order to calculate IF of a journal, the number of citations received in a given year by journal's papers published within several previous years is divided by the number of these papers. Stated more formally [Egghe, 1988; Rousseau, 1988], let $PUB(t)$ be the total number of papers published in a journal j during the year t and $CIT(T, t)$ be the total number of citations received in the year T by all papers published in the journal j during the year t . Then the n -year impact factor for the year T can be defined as follows:

$$IF = \frac{\sum_{t=1}^n CIT(T, T-t)}{\sum_{t=1}^n PUB(T-t)} \quad (1)$$

The impact factor is published by Thomson Reuters Corporation, in its database Journal Citation Reports (JCR),⁶ for $n = 2$ and $n = 5$. However, the optimal “publication window” (parameter n) is still being debated. The two-year impact factor ($n = 2$) is thought to be the classical case. However, sometimes the 5-year impact factor is more appropriate than 2-year because in certain fields of science it takes a longer time to assimilate new knowledge. Moreover, depending on the area of research and type of the papers, there are differences between how quickly they become obsolete and stop being cited in the literature.

Both abovementioned publication windows have been analyzed. However, the discrepancies between rankings based on IF with different publication windows were found to be insignificant. Therefore, we use only 2-year impact factor for the further analysis.

2.2. SNIP (Source Normalized Impact per Paper)

The SNIP indicator, introduced in [Moed, 2010], measures the citation impact of scientific journals corrected for the differences in citation practice between scientific fields. Another

⁶ This product is based on another Thomson database, Web of Science (WoS). WoS contains citation data on an individual paper level, while JCR aggregates citation indicators for journals as a whole.

advantage of this indicator is that it does not require a field classification system in which the boundaries of fields are explicitly defined and not flexible. A journal's subject field is defined as the set of papers published in a current year and citing at least one of the 1-10 year old papers published in the journal.

The SNIP is defined as the ratio of journal's raw impact per paper (RIP) to the relative database citation potential (RDCP):

$$SNIP = \frac{RIP}{RDCP} \quad (2)$$

The RIP is similar to the impact factor except that three instead of two years of cited publications are used and only citations to publications of the specific document types (article, conference paper, or review) are included.

To calculate the RDCP, a journal's database citation potential (DCP) is divided by the median DCP value for all journals in the database. In its turn, the DCP equals the average number of "active references" in the papers belonging to the journal's subject field. "Active references" are references to papers that appeared within the three preceding years in sources covered by the database (Scopus). All references to documents older than three years or not indexed by Scopus do not affect DCP.

Thus, SNIP: (a) corrects for different citation practices in different fields (average number of references); (b) equalizes a field relatively well represented in the database and a field where there are many references to sources outside the database (for instance, a discipline where books are cited more frequently than journal articles); (c) makes equal those fields where most recent literature is cited with those where older documents receive a considerable number of citations.

The SNIP indicator is made available in Elsevier's Scopus database, together with another journal indicator, the SCImago Journal Rank (SJR), which is described below.

Data on SNIP are regularly updated. In our analysis we use data downloaded from the Scopus web site⁷ in 2013.

2.3. SJR (SCImago Journal Rank)

The indicator was introduced in [Gonzalez-Pereira et al., 2010]. It evaluates journal taking into account not just the number of citations received but also the quality of the source of these citations. For this reason, weights are assigned to all citations based on a 'prestige' of the journals where they come from, so that citations received from the more prestigious journals are more

⁷ <http://www.journalmetrics.com/values.php>. As of 2013 'optimized' values of SNIP (so called SNIP2: [Waltman et al., 2013]) are published. We use older version of SNIP intentionally, since it has already been tested for a while by the academic community. The latest published data are the values for the first half of 2013. The same is to be said about SJR (see below).

valuable than those from less prestigious ones. The prestige is computed recursively, i.e., the prestigious journals are those which receive many citations from other prestigious journals.

At the first stage of the procedure all journals get the equal level of prestige. Then the new level of prestige is computed based on citations received by a journal. On the next stage we re-evaluate the prestige of each journal counting citations it received, each citation is taken with the weight corresponding to the prestige of the citing journal. The algorithm iterates until a steady-state solution is reached, and the final prestige values reflect the journals' scientific importance. Precise mathematical description can be found in [Gonzalez-Pereira et al., 2010].

It should be noted that this procedure is equivalent to counting how often a reader would take a certain journal, if she randomly walks from journal to journal following citation links.

Only citations made to papers published within last three years are taken into account in SJR. If the number of journal self-citations is large then it is artificially reduced and is set to 33% of all citations made to this journal. Finally, journal's SJR is normalized by the number of its articles; therefore the value of this indicator is independent of journal's volume. In this study we use values for 2013.

2.4. Article influence score

Another "weighted" indicator, the article influence score, also takes into account the relative importance of citing journals. It is calculated similarly to SJR, the main difference being citation database it is based on. For calculating article influence the Web of Science is used as a source of the data, so the values for this indicator are published in JCR database.

There are several other technical distinctions from SJR methodology, the main are: (a) the publication window for the article influence calculation is 5 years, not 3 years as for SJR; (b) self-citations are totally excluded, whereas for SJR they just have upper limit of 33% of all citations.

JCR publishes article influence values since 2007; they also may be found with 1-year embargo in open access at <http://eigenfactor.org/> (but see [Jacsó, 2010] on differences in data obtained from two different systems). In this study we use values for 2013.

2.5. Hirsch index (H-index)

Hirsch index [Hirsch, 2005] evaluates both the number of papers and their citedness. By definition, the h-index for a set of publication equals h , if exactly h papers from the set have received no less than h citations, while the others have received no more than h citations. This indicator does not involve calculation of the averages, thus the h-index is robust with respect to outliers (e.g. when there is one paper with enormously large number of citations which significantly affects their average number). To have a high value of h-index a journal has to publish many frequently cited papers.

Initially h-index was introduced to assess the output of a scientist, but it can also be applied to journals. For instance, [Braun *et al.*, 2006] consider the set of articles published in a journal in a certain year and calculate their citedness at present (in their case, four years after publication). In this paper we use a more balanced approach adopted in the work on computation of aggregate rankings for economic journals [Aleskerov *et al.*, 2013a]: we take into account papers published in a journal over five years (from 2009 to 2013) and citations received over the same period. The values of h-index depend upon a database one uses. We use the Web of Science database to calculate H-index.

It should also be noted that h-index has certain disadvantages. The most evident one is the following: the papers with low citedness (below and, in certain cases, equal to h) are completely ignored. Indeed, suppose there are two journals with 50 papers published in each of them. In the first journal each paper have received 10 citations, while 10 papers in the second one have received 10 citations each, but the other 40 papers have not been cited at all. The journals are clearly unequal by their ‘influence’, but their h-index values are the same — 10.

3. Data and the analysis of single-indicator-based rankings

Three sets of journals are studied hereafter, representing three academic disciplines: education, public administration and sociology. We analyze the degree of consistency between the bibliometric indicators (impact factor, article influence score, SNIP, SJR and H-index), for each set of journals separately. In 2013, the SJR database included 138 journals in sociology, 219 journals in education and 46 journals in public administration, which were also indexed in the Scopus database. Thus, the values of indicators for the selected journals could be extracted (or calculated in the case of H-index). However, for 8 journals in sociology some of the indicators were missing from JCR. Six more journals did not have their SJR and/or SNIP values. These 14 journals are excluded, leaving 124 journals in sociology for further analysis. For the same reason 46 education and 8 public administration journals are excluded as well. As a result, for 124, 173 and 38 journals in sociology, education and public administration the values of impact factor (2013), article influence (2013), h-index (2009-2013), SNIP (2013) and SJR (2013) have been extracted. The data sources are summarized in Table 1.

Table 1. Data sources

Indicator	Database	Year(s)
impact factor (2-year)	JCR/WoS	2013
SNIP	Scopus	2013

SJR	Scopus	2013
article influence	JCR/WoS	2013
h-index	WoS	2009–2013 (papers and citations)

The values of these bibliometric indicators are used to rank journals. Basically, ranking is a set of positions (called ranks) in which one or more journals can be put. Journals with matching values are given the same position in the ranking, and this corresponds to the same rank. Meanwhile, journals with different values are given different positions, which are ordered by descending values of indicators and are identified by natural numbers, from the ‘best’ value to the ‘worst’ one. Ranks of journals in education, public administration and sociology, for each indicator are listed in the Appendix 1 (Tables 7–9).

As our ranks are ordinal variables, rank correlation can be estimated by *Spearman’s measure*. Since percentage of duplicate values in the rankings is relatively low, this coefficient is calculated as follows:

$$\rho = 1 - \frac{6 \sum_{i=1}^n (x_i - y_i)^2}{n(n^2 - 1)}, \quad (3)$$

where x_i, y_i are ranks of journal i in two compared rankings X and Y, and n is the total number of journals.

To make it clear, let us suppose that there are two rankings, which rank journals as follows:

	Ranking 1	Ranking 2
Journal A	1	7
Journal B	2	4
Journal C	3	5
Journal D	4	1
Journal E	5	3
Journal F	6	2
Journal G	7	8
Journal H	8	6

In this case,

$$\rho = 1 - \frac{6 * ((1 - 7)^2 + (2 - 4)^2 + (3 - 5)^2 + (4 - 1)^2 + (5 - 3)^2 + (6 - 2)^2 + (7 - 8)^2 + (8 - 6)^2)}{8 * (8^2 - 1)}$$

Hence, the Spearman correlation between the two rankings is approximately 0.07.

However, if ranks of journals are equal, their values are recalculated so that they are given by the arithmetic average of their positions in ranking. Then, the whole procedure is repeated as mentioned above.

Spearman's ρ , unlike broadly used Pearson's coefficient, is not affected by outliers too much, as it limits them to the values of their ranks. Its value ranges from +1 to -1. $\rho=1$ means that rankings are the same and $\rho = -1$ that they are completely different. Results for Spearman's ρ measure for all academic disciplines under consideration are given in Tables 2.1-2.3.

Table 2.1. Spearman's ρ (sociology)

	Impact Factor	Article Influence Score	SNIP	SJR	H-index
Impact Factor	1,00	0,85	0,76	0,87	0,86
Article Influence Score	0,85	1,00	0,78	0,86	0,81
SNIP	0,76	0,78	1,00	0,87	0,70
SJR	0,87	0,86	0,87	1,00	0,84
H-index	0,86	0,81	0,70	0,84	1,00

Table 2.2. Spearman's ρ (education)

	Impact Factor	Article Influence Score	SNIP	SJR	H-index
Impact Factor	1,00	0,87	0,82	0,86	0,83
Article Influence Score	0,87	1,00	0,80	0,91	0,81
SNIP	0,82	0,80	1,00	0,88	0,73
SJR	0,86	0,91	0,88	1,00	0,82
H-index	0,83	0,81	0,73	0,82	1,00

Table 2.3. Spearman's ρ (public administration)

	Impact Factor	Article Influence Score	SNIP	SJR	H-index
Impact Factor	1,00	0,92	0,85	0,85	0,91
Article Influence Score	0,92	1,00	0,90	0,90	0,89
SNIP	0,85	0,90	1,00	1,00	0,84
SJR	0,85	0,90	1,00	1,00	0,84
H-index	0,91	0,89	0,84	0,84	1,00

For all academic disciplines, ρ reveals significant correlation between rankings based on each bibliometric indicator. In fact, Spearman's ρ for every pair of rankings is not less than 0.70 for journals in sociology, 0.73 for educational journals, and 0.84 for journals in public administration.

Concerning the highest level of correlation, for social science journals it is between SJR and SNIP rankings (1.00) for public administration, and about 0.85 in other academic disciplines; the second highest correlation is between Impact Factor and Article Influence Score rankings (0.87) in education and public administration disciplines. Correlation between public administration journals' rankings is high: the ρ coefficient exceeds 0.9. We should note that the correlation coefficients could be biased in the case of public administration science because of the small sample of the available journals. For the other pairs of rankings ρ coefficient is not less than 0.70 for journals in all fields.

Thus, the analysis of correlations presented in this Section shows that different indicators generate similar but not identical rankings. We believe that the disparities result mainly from complexity and multidimensionality of the journal quality and significance. Furthermore, the indicators differ largely conceptually. Therefore, rather than trying to choose the best indicator it is worth using ordinal methods developed in the theory of social choice that combine information contained in separate variables. Thus, ranking of journals becomes a multi-criteria evaluation problem.

4. The description of threshold procedure and other ordinal ranking methods

The obtained values of the rank correlation coefficients show that the use of different indicators leads to a similar, but not coincident rankings of journals. Furthermore, the indicators differ to a great extent conceptually.

A standard solution to a multi-criteria evaluation problem is to calculate a weighted sum of criteria values for each alternative, and then rank alternatives by the value of this sum. However, there is a severe restriction on this approach – the weights should be justified. We have no such justification for the problem under consideration. Therefore, we cannot be sure that a linear convolution of bibliometric indicators is a correct procedure yielding meaningful results.

The alternative solution could be the use of ordinal methods developed in the theory of social choice and, in particular, an application of the threshold procedure [Aleskerov et al., 2010a, 2010b].

Social choice rules

Let us introduce several important notions. The concepts and rules used below can be found in Aleskerov (1985), Aleskerov (1992), Aleskerov et al., (2010a, 2011, 2013), Copeland (1951), Chebotarev, Shamis (1999), Ward (1961), Schwartz (1970, 1972, 1977), Good (1971), Smith (1973).

Definition 1. Majority relation for a given profile \vec{P} is a binary relation μ which is constructed as follows

$$x\mu y \Leftrightarrow \text{card}\{i \in N \mid xP_i y\} > \text{card}\{i \in N \mid yP_i x\}$$

Definition 2. Condorcet winner $CW(\vec{P})$ in the profile \vec{P} is an element undominated in the majority relation μ (constructed according to the profile), i.e.,

$$CW(\vec{P}) = \{a \mid \nexists x \in A, x\mu a\}$$

Definition 3. A contraction of a profile \vec{P} onto the set $X \subseteq A$, $X \neq \emptyset$ is a profile

$$\vec{P}/X = (P_1/X, \dots, P_n/X), \quad P_i/X = P_i \cap (X \times X)$$

Definition 4. Upper counter set of an alternative x in the relation P is the set $D(x)$ such that

$$D(x) = \{y \in A \mid yPx\}$$

Lower counter set of x in the relation P is the set $L(x)$ such that

$$L(x) = \{y \in A \mid xPy\}$$

The rules under study can be divided into several groups:

- a) Scoring Rules;
- b) Rules, using value function;
- c) Rules, using tournament matrix;

Scoring Rules

Hare's Procedure. Firstly simple majority rule is used. If such alternative exists, the procedure stops, otherwise, the alternative x with the minimum number of votes is omitted. Then the procedure again applied to the set $X = A \setminus \{x\}$ and the profile \vec{P} / X .

Borda's Rule. Put to each $x \in A$ into correspondence a number $r_i(x, \vec{P})$ which is equal to the cardinality of the lower contour set of x in $P_i \in \vec{P}$, i.e. $r_i(x, \vec{P}) = \text{card}(L_i(x))$. The sum of that numbers over all i is called Borda's count for alternative x .

Alternative with maximum Borda's count is chosen., i.e.

$$a \in C(\vec{P}) \Leftrightarrow \left[\forall b \in A, r(a, \vec{P}) \geq r(b, \vec{P}) \right], \quad r(a, \vec{P}) = \sum_{i=1}^n r_i(a, P_i)$$

Black's Procedure. If Condorset winner exists, it is to be chosen. Otherwise, Borda's Rule is applied.

Inverse Borda's Procedure. For each alternative Borda's count is calculated. Then the alternative a with minimum count is omitted. Borda's count are re-calculated for profile \vec{P} / X , $X = A \setminus \{a\}$, and procedure is repeated until choice is found.

Nanson's Procedure. For each alternative Borda's count is calculated. Then the average count is calculated, $\bar{r} = \left(\sum_{a \in A} r(a, \vec{P}) \right) / |A|$, and alternatives $c \in A$ are omitted for which $r(c, \vec{P}) < \bar{r}$.

Then the set $X = \{a \in A \mid r(a, \vec{P}) \geq \bar{r}\}$ is considered, and the procedure applied to the profile \vec{P} / X . Such procedure is repeated until choice will not be empty.

Rules, using value function

Copeland's rule 1. Construct function $u(x)$, which is equal to the difference of cardinalities of lower and upper contour sets of alternative x in majority relation μ , i.e., $u(x) = \text{card}(L(x)) - \text{card}(D(x))$. Then the social choice is defined by maximization of u , that is

$$x \in C(\vec{P}) \Leftrightarrow [\forall y \in A, u(x) \geq u(y)].$$

Copeland's rule 2. Function $u(x)$ is defined by cardinality of lower contour set of alternative x in majority relation μ . Social choice is defined by maximization of u .

Copeland's rule 3. Function $u(x)$ is constructed by cardinality of upper contour set of alternative x in majority relation μ . Social choice is defined by minimization of u .

Rule, using tournament matrix

Simpson's Procedure (Maxmin Procedure).

Construct matrix S^+ , such that

$$\forall a, b \in X, S^+ = (n(a, b))$$

$$n(a, b) = \text{card} \{i \in N \mid a P_i b\}, \quad n(a, a) = +\infty$$

Social choice is defined as

$$x \in C(P) \Leftrightarrow x = \arg \max_{a \in A} \min_{b \in A} (n(a, b)).$$

Threshold procedure

To find a solution to a multi-criteria evaluation problem we proposed to apply the threshold procedure [Aleskerov et al., 2010a, 2010b], which possesses the so-called ‘non-compensatory’ nature. This means that high values of some citation indicators cannot be traded for low values of the others. Therefore, this procedure reduces opportunities for improving the simulated place of the journal in the ranking by increasing one of the used indices. The ‘non-compensatory’ procedure also reduces the incentive to increase the number of low-quality papers and to attract insignificant citations, as the journals with no many frequently cited publications are not able to take a very high place in the rankings [Aleskerov et al., 2013a.].

Before we give a formal definition of the procedure, let us provide some informal explanation of it. Assume that we have only three journals $J1, J2, J3$ evaluated with respect to 3 criteria, such as impact factor, h-index and SJR. Let the ranks of the journals with respect to the indicators be given in Table 3, the smaller is the number of rank, the better is the journal.

Table 3. Example

	IF	h-index	SJR
J1	3	3	1
J2	2	2	2
J3	3	2	2

Then, according to the threshold procedure, for $J1$ the value of 1 for SJR index does not compensate the worst values for IF and h-index, so $J1$ in aggregated ranking gets lower rank than

J2. Even *J3* since it has worse ranks than *J1* is placed in the final ranking above *J1*. The final ranking looks as $J2 > J3 > J1$.

In other words, the procedure punishes low values of indicators stronger than rewards high values. This is exactly the reason why we suggest using it in the construction of aggregated ranking.

Now, let us give a formal definition of the procedure. Let A be a finite set of alternatives, which are evaluated on n criteria. In the present paper different journals are assumed to be alternatives and different bibliometric indicators are regarded as criteria.

For each indicator, the sample is split into m grades, where the first grade corresponds to the 'best' journals. On the next stage, to each alternative x from A , a vector (x_1, x_2, \dots, x_n) is assigned, where x_j is the grade of the alternative according to the criterion j , i.e. $x_j \in \{1, \dots, m\}$.

The goal of the threshold procedure is to rank the set A based on the vector of grades (x_1, x_2, \dots, x_n) for each $x \in A$.

We assume that the set A consists of all possible vectors of this form.

Let $v_j(x)$ be the number of ranks j in the vector x , i.e. $v_j(x) = |\{1 \leq i \leq n: x_i = j\}|$. It should be noted that $0 \leq v_j(x) \leq n$ for all $j \in \{1, \dots, m\}$ and $x \in A$, and $v_1(x) + \dots + v_m(x) = n$ for all $x \in A$.

The alternative $x \in A$ is said to be (strictly) preferred to the other alternative $y \in A$ (x dominates y or, shortly, xPy) if we can find the number k , $1 \leq k \leq n$, such that $v_j(x) = v_j(y)$ for all numbers $k+1 \leq j \leq m$ and $v_k(x) < v_k(y)$ (if $k=m$, the condition $v_j(x) = v_j(y)$ can be omitted). The relation P is called the threshold relation.

In other words, a vector x is more preferable than a vector y if x has less grades m than y ; if both of these vectors have the same number of grades m , then the numbers of grades $m-1$ are compared, and so on.

After making these comparisons, we obtain a weak order P , the undominated elements of which are the best journals; to these journals the rank 1 is assigned. After excluding these journals, we get the set of the second best alternatives to which we assign the rank 2. Then, we proceed in this way until all the journals are ranked.

The Markovian method

Finally, we would like to apply a version of a ranking called the Markovian method, since it is based on an analysis of Markov chains that model stochastic moves from vertex to vertex via arcs of a digraph representing a binary relation μ . The earliest versions of this method were proposed by Daniels (1969) and Ushakov (1971). References to other papers can be found in *Chebotarev, Shamis (1999)*.

To explain the method let us consider its application in the following situation. Suppose alternatives from A are chess-players. Only two persons can sit at a chess-board, therefore in

making judgments about players' relative strength, we are compelled to rely upon results of binary comparisons, i.e. separate games. Our aim is to rank players according to their strength. Since it is not possible with a single game, we organize a tournament.

Before the tournament starts we separate patently stronger players from the weaker ones by assigning each player to a certain league, a subgroup of players who are relatively equal in their strength. To make the assignments, we use the sorting procedure described in the previous subsection. The tournament solution that is used for the selection of the strongest players is the weak top cycle *WTC* (Ward, 1961; Schwartz, 1970, 1972, 1977; Good, 1971; Smith, 1973). It is defined in the following way. A set *WTC* is called the weak top cycle if 1) any alternative in *WTC* μ -dominates any alternative outside *WTC*: $\forall x \notin WTC, y \in WTC \Rightarrow y \mu x$, and 2) none of its proper subsets satisfies this property.

The relative strength of players assigned to different leagues is determined by a binary relation μ , therefore in order to rank all players all we need to know is how to rank players of the same league. Each league receives a chess-board. Since there is only one chess-board per league, the games of a league form a sequence in time.

Players who participate in a game are chosen in the following way: a player who has been declared a (current) winner in the previous game remains at the board, her rival is randomly chosen from the rest of the players, among whom the loser of the previous game is also present. In a given league, all probabilities of being chosen are equal. If a game ends in a draw, the previous winner, nevertheless, loses her title and it passes to her rival. Therefore, despite ties being allowed, there is a single winner in each game. It is evident that the strength of a player can be measured by counting a relative number of games where he has been declared a winner (i.e. the number of his wins divided by the total number of games in a tournament).

In order to start a tournament, we need to decide who is declared a winner in a fictitious “zero-game”. However, the longer the tournament goes (i.e. the greater the number of tournament games there are), the smaller the influence of this decision on the relative number of wins of any player is. In the limit when the number of games tends to infinity, relative numbers of wins are completely independent of who had been given “the crown” before the tournament started.

Instead of calculating the limit of the relative number of wins, one can find the limit of the probability a player will be declared a winner in the last game of the tournament since these values are equal. We can count the probability and its limit using matrices **M** and **T**.

For computational purposes a majority relation μ is represented by a majority matrix **M**=[m_{xy}], defined in the following way:

$$m_{xy}=1 \Leftrightarrow (x, y) \in \mu, \text{ or } m_{xy}=0 \Leftrightarrow (x, y) \notin \mu.$$

A matrix **T**=[t_{ij}] representing a set of ties τ is defined in the same way.

Suppose we somehow know the relative strength of players in each pair of them. Also, suppose this strength is constant over time and is represented by binary relations μ and τ . Therefore, if we know μ and the names of the players who are sitting at the chess-board, we can predict the result of the game: the victory of x (if $x\mu y$), the victory of y (if $y\mu x$) or a draw (if $x\tau y$).

Let $\mathbf{p}^{(k)}$ denote a vector, i -th component $p_i^{(k)}$ of which is the probability a player number i is declared the winner of a game number k . Two mutually exclusive situations are possible. The first case - the player number i is declared the winner in both the previous game (game number $k-1$) and the current game. She can be declared the winner in the game number k , if and only if her rival (who has been chosen by lot) belongs to the lower section of i . The probability that the i -th player was declared the winner in the game number $k-1$ is $p_i^{(k-1)}$, the probability of her rival being in $L(i)$ equals $\frac{s_2(i)}{m-1}$, where $s_2(i)$ is the Copeland score (the 2nd version), $s_2(x)=|L(x)|$. Thus, the probability of the i -th player being declared the winner in game number k is:

$$p_i^{(k-1)} \cdot \frac{s_2(i)}{m-1}$$

The second case - the player number i is declared the winner in the current game, but not in the previous one. He can be declared the winner in game number k , if and only if 1) he has been chosen by lot as a rival to the winner in the game number $k-1$, the probability of which equals $\frac{1}{m-1}$; and 2) if the $(k-1)$ -th winner is in the lower section or in the horizon of the i -th player, a probability of which equals:

$$\sum_{j=1}^m (m_{ij} + t_{ij}) \cdot p_j^{(k-1)}$$

Thus the probability $p_i^{(k)}$ can be determined from the following equation:

$$p_i^{(k)} = p_i^{(k-1)} \cdot \frac{s_2(i)}{m-1} + \frac{1}{m-1} \cdot \sum_{j=1}^m (m_{ij} + t_{ij}) \cdot p_j^{(k-1)} \quad (3)$$

Formula (3) can be rewritten in a matrix-vector form as

$$\mathbf{p}^{(k)} = \mathbf{W} \cdot \mathbf{p}^{(k-1)} = \frac{1}{m-1} \cdot (\mathbf{M} + \mathbf{T} + \mathbf{S}) \cdot \mathbf{p}^{(k-1)} \quad (4)$$

The matrix $\mathbf{S}=[s_{ij}]$ is defined as $s_{ii}=s_2(i)$ and $s_{ij}=0$ when $i \neq j$. Consequently, passing the title of the current winner from player to player is a Markovian process with the transition matrix \mathbf{W} .

We are interested in vector $\mathbf{p} = \lim_{k \rightarrow \infty} \mathbf{p}^{(k)}$. It is not hard to prove that no matter what the initial conditions are (i.e. what the value of $\mathbf{p}^{(0)}$ is), the limit vector is an eigenvector of the matrix \mathbf{W} corresponding to the eigenvalue $\lambda=1$ (see, for instance, Laslier (1997)). Therefore \mathbf{p} is determined by solving the system of linear equations $\mathbf{W} \cdot \mathbf{p} = \mathbf{p}$. To rank players in a league, one needs to order them by decreasing values of p_i . Since we have pre-sorted players using WTC, none of the components p_i is equal to zero (Laslier, 1997).

5. Aggregated rankings for journals

Aggregate journal ratings, based on paired comparisons of journals by five bibliometric indicators using Hare's Procedure, Borda's Rule, Black's Procedure, Nanson's Procedure, Copeland's rule, Simpson's Procedure, Threshold procedure and Markovian method are given in Appendix 1 Tables 7-9. Based on the values of bibliometric indicators the journal ratings are constructed. Rating - is a ranking, which consists of positions (places to which you can put one or several journals). Journals with the same values of the index correspond to the one position in ranking, and with mismatched index values correspond to different positions. Positions are ordered by "deterioration" (in our case - descending order) of indices values and numbered by natural numbers, starting at the position corresponding to the "best" value. The numbers of journals in the rankings for each bibliometric indicators are shown in Appendix 1 Tables 7-9.

Tables 4-6 contain the results of the correlation analysis of the aggregated ratings, constructed using the rules, which were discussed above.

Table 4. Correlation coefficients between the aggregated ratings of journals in sociology

	Borda grades	Hare grades	Copeland 1 grades)	Copeland 2 grades	Copeland 3 grades	Nanson grades	Duo-Simpson grades	Black grades	Inverse Borda grades	Markovian method	Threshold grade (the more the better)
Borda grades	1,00	0,93	1,00	1,00	0,99	0,99	0,99	1,00	0,99	0,98	0,98
Hare grades	0,93	1,00	0,94	0,94	0,94	0,95	0,95	0,94	0,95	0,96	0,93
Copeland 1 grades	1,00	0,94	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,98	0,98
Copeland 2 grades	1,00	0,94	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,98	0,98
Copeland 3 grades	0,99	0,94	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,98	0,98
Nanson grades	0,99	0,95	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,98	0,98
Duo Simpson grades	0,99	0,95	1,00	1,00	1,00	1,00	1,00	0,99	1,00	0,98	0,98
Black grades	1,00	0,94	1,00	1,00	1,00	1,00	0,99	1,00	0,99	0,98	0,98
Inverse Borda grades	0,99	0,95	1,00	1,00	1,00	1,00	1,00	0,99	1,00	0,98	0,98
Markovian method	0,98	0,96	0,98	0,98	0,98	0,98	0,98	0,98	0,98	1,00	0,99
Threshold grade (the more the better)	0,98	0,93	0,98	0,98	0,98	0,98	0,98	0,98	0,98	0,99	1,00

Table 5. Correlation coefficients between the aggregated ratings of journals in education

	Borda grades	Hare grades	Copeland 1 grades)	Copeland 2 grades	Copeland 3 grades	Nanson grades	Duo-Simpson grades	Black grades	Inverse Borda grades	Markovian method	Threshold grade (the more the better)
Borda grades	1,00	0,95	1,00	0,99	1,00	0,99	0,99	1,00	0,99	0,97	0,97
Hare grades	0,95	1,00	0,96	0,96	0,96	0,96	0,96	0,95	0,96	0,96	0,94
Copeland grades 1	1,00	0,96	1,00	1,00	1,00	1,00	0,99	1,00	1,00	0,97	0,97
Copeland grades 2	0,99	0,96	1,00	1,00	1,00	1,00	0,99	1,00	1,00	0,97	0,97
Copeland grades 3	1,00	0,96	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,97	0,97
Nanson grades	0,99	0,96	1,00	1,00	1,00	1,00	1,00	0,99	1,00	0,97	0,97
Duo Simpson grades	0,99	0,96	0,99	0,99	1,00	1,00	1,00	0,99	1,00	0,97	0,97
Black grades	1,00	0,95	1,00	1,00	1,00	0,99	0,99	1,00	0,99	0,97	0,97
Inverse Borda grades	0,99	0,96	1,00	1,00	1,00	1,00	1,00	0,99	1,00	0,97	0,97
Markovian method	0,97	0,96	0,97	0,97	0,97	0,97	0,97	0,97	0,97	1,00	0,99
Threshold grade (the more the better)	0,97	0,94	0,97	0,97	0,97	0,97	0,97	0,97	0,97	0,99	1,00

Table 6. Correlation coefficients between the aggregated ratings of journals in public administration

	Borda grades	Hare grades	Copeland 1 grades)	Copeland 2 grades	Copeland 3 grades	Nanson grades	Duo-Simpson grades	Black grades	Inverse Borda grades	Markovian method	Threshold grade (the more the better)
Borda grades	1,00	0,93	0,99	0,99	0,98	0,98	0,97	1,00	0,98	0,96	0,84
Hare grades	0,93	1,00	0,96	0,96	0,96	0,96	0,98	0,93	0,97	0,96	0,86
Copeland grades 1	0,99	0,96	1,00	1,00	1,00	1,00	0,99	0,99	1,00	0,98	0,86
Copeland grades 2	0,99	0,96	1,00	1,00	1,00	1,00	0,99	0,99	1,00	0,98	0,86
Copeland grades 3	0,98	0,96	1,00	1,00	1,00	0,99	0,99	0,99	0,99	0,98	0,86
Nanson grades	0,98	0,96	1,00	1,00	0,99	1,00	0,99	0,99	1,00	0,98	0,86

Duo Simpson grades	0,97	0,98	0,99	0,99	0,99	0,99	1,00	0,98	0,99	0,98	0,86
Black grades	1,00	0,93	0,99	0,99	0,99	0,99	0,98	1,00	0,99	0,97	0,85
Inverse Borda grades	0,98	0,97	1,00	1,00	0,99	1,00	0,99	0,99	1,00	0,98	0,86
Markovian method	0,96	0,96	0,98	0,98	0,98	0,98	0,98	0,97	0,98	1,00	0,88
Threshold grade (the more the better)	0,84	0,86	0,86	0,86	0,86	0,86	0,86	0,85	0,86	0,88	1,00

Correlation analysis also shows that aggregate rankings reduce the number of contradictions. Finally, we quantified the degree of consistency between the initial single bibliometric indicators and consensus indices for each set of journals separately. As a result, we could note that there are high values of coherence between individual and aggregate indices. It means that single-indicator-based rankings could be successfully replaced by aggregate rankings, because the latter ones combine information contained in the set of single-indicator-based rankings. Tables 7-9 contain the results of the correlation analysis of the aggregated rankings, constructed using the social choice rules and rankings, based on initial indicators.

Table 7. Correlation coefficients between the aggregated rankings and single-indicator-based rankings of journals in public administration

	Impact Factor	Article Influence Score	SNIP	SJR	H-index	Borda grades	Hare grades	Copeland 3 grades	Nanson grades	Duo-Simpson grades	Black grades	Inverse Borda grades	Markovian method	Threshold grade
Impact Factor	1,00	-	-	-	-	-	-	-	-	-	-	-	-	-
Article Influence Score	0,92	1,00	-	-	-	-	-	-	-	-	-	-	-	-
SNIP	0,85	0,90	1,00	-	-	-	-	-	-	-	-	-	-	-
SJR	0,85	0,90	1,00	1,00	-	-	-	-	-	-	-	-	-	-
H-index	0,91	0,89	0,84	0,84	1,00	-	-	-	-	-	-	-	-	-
Borda grades	0,95	0,96	0,92	0,92	0,96	1,00	-	-	-	-	-	-	-	-
Hare grades	0,85	0,91	1,00	1,00	0,84	0,93	1,00	-	-	-	-	-	-	-
Copeland 3 grades	0,93	0,97	0,96	0,96	0,92	0,98	0,96	1,00	-	-	-	-	-	-
Nanson grades	0,93	0,96	0,96	0,96	0,92	0,98	0,96	0,99	1,00	-	-	-	-	-
Duo-Simpson grades	0,92	0,95	0,98	0,98	0,90	0,97	0,98	0,99	0,99	1,00	-	-	-	-
Black grades	0,95	0,97	0,93	0,93	0,95	1,00	0,93	0,99	0,99	0,98	1,00	-	-	-
Inverse Borda grades	0,93	0,96	0,97	0,97	0,92	0,98	0,97	0,99	1,00	0,99	0,99	1,00	-	-
Markovian method	0,92	0,96	0,96	0,96	0,88	0,96	0,96	0,98	0,98	0,98	0,97	0,98	1,00	-
Threshold grade	0,74	0,84	0,87	0,87	0,77	0,84	0,86	0,86	0,86	0,86	0,85	0,86	0,88	1,00

Table 8. Correlation coefficients between the aggregated rankings and single-indicator-based rankings of journals in sociology

	Impact Factor	Article Influence Score	SNIP	SJR	H-index	Borda grades	Hare grades	Copeland 3 grades	Nanson grades	Duo-Simpson grades	Black grades	Inverse Borda grades	Markovian method	Threshold grade
Impact Factor	1,00	-	-	-	-	-	-	-	-	-	-	-	-	-
Article Influence Score	0,85	1,00	-	-	-	-	-	-	-	-	-	-	-	-
SNIP	0,76	0,78	1,00	-	-	-	-	-	-	-	-	-	-	-
SJR	0,87	0,86	0,87	1,00	-	-	-	-	-	-	-	-	-	-
H-index	0,86	0,81	0,70	0,84	1,00	-	-	-	-	-	-	-	-	-
Borda grades	0,93	0,93	0,88	0,96	0,89	1,00	-	-	-	-	-	-	-	-
Hare grades	0,91	0,88	0,84	0,90	0,91	0,93	1,00	-	-	-	-	-	-	-
Copeland 3 grades	0,93	0,93	0,88	0,97	0,89	0,99	0,94	1,00	-	-	-	-	-	-
Nanson grades	0,93	0,92	0,88	0,97	0,90	0,99	0,95	1,00	1,00	-	-	-	-	-
Duo-Simpson grades	0,93	0,93	0,87	0,97	0,90	0,99	0,95	1,00	1,00	1,00	-	-	-	-
Black grades	0,93	0,93	0,88	0,97	0,90	1,00	0,94	1,00	1,00	0,99	1,00	-	-	-
Inverse Borda grades	0,93	0,92	0,88	0,97	0,90	0,99	0,95	1,00	1,00	1,00	0,99	1,00	-	-
Markovian method	0,94	0,91	0,86	0,94	0,91	0,98	0,96	0,98	0,98	0,98	0,98	0,98	1,00	-
Threshold grade	0,92	0,92	0,87	0,95	0,87	0,98	0,93	0,98	0,98	0,98	0,98	0,98	0,99	1,00

Table 9. Correlation coefficients between the aggregated rankings and single-indicator-based rankings of journals in education

	Impact Factor	Article Influence Score	SNIP	SJR	H-index	Borda grades	Hare grades	Copeland 3 grades	Nanson grades	Duo-Simpson grades	Black grades	Inverse Borda grades	Markovian method	Threshold grade
Impact Factor	1,00	-	-	-	-	-	-	-	-	-	-	-	-	-
Article Influence Score	0,87	1,00	-	-	-	-	-	-	-	-	-	-	-	-
SNIP	0,82	0,80	1,00	-	-	-	-	-	-	-	-	-	-	-
SJR	0,86	0,91	0,88	1,00	-	-	-	-	-	-	-	-	-	-
H-index	0,83	0,81	0,73	0,82	1,00	-	-	-	-	-	-	-	-	-
Borda grades	0,93	0,94	0,90	0,96	0,91	1,00	-	-	-	-	-	-	-	-

Hare grades	0,92	0,89	0,87	0,92	0,90	0,95	1,00	-	-	-	-	-	-	-
Copeland 3 grades	0,93	0,95	0,90	0,97	0,89	1,00	0,96	1,00	-	-	-	-	-	-
Nanson grades	0,94	0,95	0,90	0,97	0,88	0,99	0,96	1,00	1,00	-	-	-	-	-
Duo-Simpson grades	0,93	0,95	0,90	0,97	0,88	0,99	0,96	1,00	1,00	1,00	-	-	-	-
Black grades	0,93	0,94	0,90	0,96	0,91	1,00	0,95	1,00	0,99	0,99	1,00	-	-	-
Inverse Borda grades	0,94	0,95	0,90	0,97	0,89	0,99	0,96	1,00	1,00	1,00	0,99	1,00	-	-
Markovian method	0,94	0,93	0,85	0,93	0,88	0,97	0,96	0,97	0,97	0,97	0,97	0,97	1,00	-
Threshold grade	0,92	0,93	0,87	0,94	0,87	0,97	0,94	0,97	0,97	0,97	0,97	0,97	0,99	1,00

Conclusion

The question of how to assess research outputs published in journals is now a global concern for academics. Numerous journal ratings and rankings exist. However, rankings based on different measures are different, and that poses a problem. Different approaches to the measurement of journal influence stipulates the existence of different indices of influence, each of them has its own theoretical justification. Measuring the level of influence of scientific publications is a task for which there is no single correct solution.

Despite the increasing popularity of journal rankings to evaluate the quality of research contributions, the individual rankings for journals are usually feature only modest agreement. In this paper, five most popular bibliometric indices were used as initial empirical data: The Impact factor, Source Normalized Impact per Paper, SCImago Journal Rank, Article influence score and Hirsch index. Correlation analysis of rankings for journals in education, sociology and public administration in general reproduced the results of previous studies (*Alesgerov et al., 2011*).

Nevertheless, despite the fact that the ratings, based on various indices, are very similar, there are significant discrepancies between them, and the selection of the rating that should be used for particular solutions is problematic.

Our purpose was to answer the question - whether the aggregated ratings, constructed using ordinal methods and models of social choice theory, the use of which eliminates the issue of homogeneity of different measurements - are more efficient tool for estimation than the individual ratings.

We have calculated ten rankings, using Hare's Procedure, Borda's Rule, Black's Procedure, Nanson's Procedure, three Copeland's rules, Simpson's Procedure, Threshold procedure and Markovian method.

Correlation analysis showed that the value of the correlation indices for each of the constructed aggregated rankings exceed the values obtained by the comparison of the individual bibliometric indices, i.e. the transition from the initial ratings to aggregated ones is reasonable. In other words, the calculated rankings can serve as integral journal ratings. If the individual indices show less coherence, the aggregated values show high correlation with each other, which means that they are more effective.

Not all social choice ranking methods have been employed in this study. The next logical step would be to widen both the arsenal of aggregation techniques and the set of empirical data.

Appendix 1

**Table 7. Ranks of sociology science journals in single-indicator-based and aggregate rankings
(journals are ordered by Journal Impact Factor)**

	Journal Impact Factor	Article Influence Score	SNIP	H-index	SJR	Borda grades	Hare grades	Copeland 1 grades	Copeland 2 grades	Copeland 3 grades	Nanson grades	DuoSimpson grades	Black grades	InverseBorda grades	Threshold grade	Markovian method
American Sociological Review	1	2	1	2	2	1	2	2	2	2	2	2	2	2	2	1
American Journal of Sociology	2	3	3	4	3	3	3	3	3	3	3	3	3	3	3	2
Annual Review of Sociology	3	1	5	1	1	1	1	1	1	1	1	1	1	1	1	3
Annals of Tourism Research	4	51	28	22	11	14	5	10	10	10	10	10	13	11	19	4
Sociological Theory	5	4	39	3	6	8	4	4	4	4	4	4	4	4	4	5
Population and Development Review	6	16	28	5	7	6	5	5	5	5	5	5	7	5	8	6
Sociological Methods and Research	7	7	39	36	20	13	10	13	13	13	13	14	14	14	10	7
Sociology of Education	8	6	39	6	4	9	5	5	5	5	6	5	8	6	5	8
Social Networks	9	5	14	11	10	5	5	8	8	8	8	5	5	8	6	9
Sociology of Health and Illness	10	26	21	37	34	18	11	23	22	25	26	23	18	26	31	10
European Sociological Review	11	10	11	10	8	7	11	8	8	8	8	9	9	8	9	11
Journal of Consumer Culture	12	12	75	13	22	14	17	14	14	14	14	15	15	15	11	12
Journal of Marriage and Family	13	15	2	7	5	4	5	5	5	5	7	8	5	7	7	13
Work and Occupations	14	25	39	25	15	21	23	21	19	21	16	16	21	16	23	14
Sociological Quarterly	15	28	21	46	37	30	24	31	30	33	28	27	30	28	33	15
Sociology of Religion	16	39	48	26	28	35	30	33	32	30	30	27	35	30	27	16
Poetics	17	30	56	50	23	27	35	26	26	26	29	27	28	29	23	17
Social Science Research	18	19	6	51	24	19	17	18	16	18	18	16	19	18	14	18
International Political Sociology	19	22	106	30	39	29	35	27	26	27	31	27	29	31	23	19
Journal of Sociology	20	46	56	24	46	38	42	38	38	37	36	34	38	36	33	20
Social Indicators Research	21	67	56	58	64	43	11	48	47	47	40	40	43	40	32	21
Economy and Society	22	13	3	29	19	17	30	16	16	16	17	16	17	17	16	22
Qualitative Research	23	27	89	19	43	24	35	27	26	27	27	27	25	27	33	23
Sociologia Ruralis	24	47	28	40	41	34	51	35	35	36	38	34	34	36	39	24

Social Problems	25	8	8	32	12	11	11	10	10	10	11	12	11	12	11	25
Agriculture and Human Values	26	62	28	68	53	43	42	44	42	40	41	40	43	43	43	26
Annual Review of Law and Social Science	27	33	56	75	45	40	51	40	38	40	42	40	40	36	45	26
Sociology	28	21	8	15	29	14	24	16	16	16	19	22	16	19	20	28
Law and Society Review	29	20	21	27	16	20	24	19	19	19	20	16	20	20	18	29
Politics and Society	30	9	39	18	35	22	17	20	22	19	21	23	22	21	23	30
Global Networks	31	18	21	17	9	12	17	15	15	15	15	10	12	10	11	30
Work, Employment and Society	32	36	28	33	31	26	42	31	30	32	33	33	27	33	36	32
International Journal of Intercultural Relations	33	64	16	76	62	54	51	52	52	53	52	46	54	54	45	32
Human Ecology	34	60	28	122	124	68	11	63	60	66	53	46	68	55	63	34
Youth and Society	35	44	39	60	59	39	42	41	41	40	42	40	39	40	36	34
Gender and Society	36	14	48	12	14	10	22	12	12	12	12	13	10	13	15	34
Cornell Hospitality Quarterly	37	90	39	49	21	50	35	42	42	40	42	34	50	43	59	37
Rural Sociology	38	48	16	65	57	42	58	45	44	47	45	46	42	46	45	38
Current Sociology	39	68	106	64	61	50	59	53	53	54	54	58	50	55	66	39
Journal for the Scientific Study of Religion	40	41	28	47	42	32	35	34	33	34	35	34	32	35	36	39
Revista de Cercetare si Interventie Sociala	41	112	75	87	68	85	42	66	67	68	69	62	76	69	65	41
Body and Society	42	29	89	8	13	23	11	24	24	21	21	16	23	21	21	42
Media, Culture and Society	43	38	56	38	47	33	51	35	37	35	36	34	33	36	39	42
Sociology of Sport Journal	44	63	56	45	25	49	42	45	44	45	46	46	49	47	29	44
Leisure Sciences	45	69	6	55	36	52	60	54	55	50	55	54	52	48	61	45
Social Forces	46	17	11	54	18	28	24	21	21	21	23	16	24	23	17	46
Society and Natural Resources	47	79	39	91	67	66	30	63	63	64	68	62	66	68	64	47
Journal of Sport and Social Issues	48	50	39	41	17	41	30	39	40	39	39	40	41	40	29	48
Language in Society	49	24	28	14	26	36	24	29	33	27	24	23	36	24	27	49
British Journal of Sociology	50	11	48	21	32	25	24	25	25	24	25	23	26	25	21	50
Cultural Sociology	51	54	106	23	49	45	51	47	47	45	48	46	45	43	39	50
International Sociology	52	42	56	48	50	46	61	43	44	40	49	53	46	48	42	50
Journal of Mathematical Sociology	53	55	48	89	76	74	61	78	76	76	78	77	74	77	68	50
Sociological Forum	54	43	56	71	40	48	61	50	47	50	47	40	48	51	45	54
Teaching Sociology	55	96	28	59	79	77	67	79	79	79	80	80	78	81	77	54
Theory and Society	56	23	28	84	77	64	42	66	68	64	65	62	64	65	61	54

Acta Sociologica	57	59	83	67	60	61	74	58	57	59	61	62	61	61	53	57
Race and Class	58	74	56	39	88	82	74	80	80	79	81	80	83	79	83	58
Social Justice Research	59	31	56	104	86	82	50	68	64	69	70	69	82	70	81	59
Ethnic and Racial Studies	60	32	56	31	30	31	35	29	29	30	32	27	31	32	43	60
Scandinavian Journal of Hospitality and Tourism	61	92	106	101	83	85	87	87	86	87	87	87	87	87	95	61
Men and Masculinities	62	65	89	28	66	58	61	59	60	60	63	58	58	63	53	61
Discourse and Society	63	34	21	34	33	37	51	35	35	37	34	34	37	34	45	63
Journal of Law and Society	64	82	75	72	89	77	74	82	82	81	83	83	78	83	83	64
Sociological Review	65	49	16	53	55	47	61	48	47	47	51	54	47	53	45	65
City and Community	66	35	89	79	51	55	61	54	54	54	56	46	55	55	57	66
Deviant Behavior	67	76	14	74	58	69	83	70	70	70	66	69	69	66	70	67
Sociological Perspectives	68	66	11	80	48	67	74	69	69	66	66	69	67	66	58	68
British Journal of Sociology of Education	69	80	21	56	38	56	51	60	57	61	58	58	56	50	66	69
Young	70	81	123	57	74	72	86	75	74	76	75	77	72	80	79	70
Social Science Quarterly	71	37	8	77	54	53	35	51	51	52	50	46	53	52	56	70
Contemporary Sociology	72	72	106	119	120	116	93	115	115	113	113	97	110	113	98	70
Crime, Media, Culture	73	77	102	70	78	84	87	81	80	81	82	82	84	82	87	73
International Review for The Sociology of Sport	74	75	48	20	27	59	42	56	56	56	57	54	59	58	60	73
Qualitative Sociology	75	52	28	78	73	70	74	72	72	72	71	74	70	72	70	73
International Journal of Comparative Sociology	76	40	56	100	75	79	67	75	76	72	76	69	78	73	70	73
Anthrozoos	77	88	83	73	80	76	67	83	82	83	84	84	77	84	81	73
Nations and Nationalism	78	71	83	35	72	71	67	73	73	74	71	74	71	74	79	73
Sexualities	79	78	83	42	69	63	67	70	70	70	71	62	63	71	78	79
Journal of Contemporary Ethnography	80	70	48	44	44	60	67	63	65	62	64	62	60	64	68	80
European Societies	81	73	56	82	70	73	74	74	74	75	74	74	73	75	83	81
Comparative Studies in Society and History	82	45	83	9	63	57	17	57	57	56	59	54	57	58	45	81
Society and Animals	83	91	48	62	92	87	87	88	88	88	88	88	88	88	83	83
Ethnography	84	53	89	83	91	81	83	84	84	84	85	85	85	85	70	83
Sociologie du Travail	85	56	89	88	106	92	87	92	91	91	91	90	92	91	76	85
European Journal of Social Theory	86	61	75	61	65	62	67	62	60	62	62	62	62	62	45	85
Journal of Leisure Research	87	85	21	69	56	74	74	77	76	76	76	69	74	76	70	87

Rationality and Society	88	58	56	94	71	79	74	85	85	85	79	77	78	78	70	88
Canadian Review of Sociology	89	101	75	86	97	93	95	94	96	93	94	94	93	94	87	89
Sociologicky Casopis	90	114	89	81	94	97	98	94	95	93	94	94	96	94	87	90
Sociological Inquiry	91	57	16	43	52	64	74	61	65	58	60	58	64	60	53	90
Symbolic Interaction	92	86	56	85	84	88	95	89	89	88	88	88	88	88	87	90
Review of Religious Research	93	102	16	93	82	93	95	94	94	93	96	96	93	96	87	90
Journal of the History of Sexuality	94	98	56	66	98	101	100	97	97	97	97	97	98	97	87	90
Human Studies	95	105	106	90	101	100	102	99	99	101	98	100	101	98	98	90
Chinese Sociological Review	96	104	89	97	102	104	103	101	101	102	99	102	104	99	98	90
Health Sociology Review	97	95	102	95	85	91	87	93	91	93	91	90	91	91	95	90
Studies in Symbolic Interaction	98	116	106	123	110	114	110	115	115	115	115	115	115	115	105	90
Soziale Welt-Zeitschrift für Sozialwissenschaftliche Forschung und Praxis	99	106	102	98	90	105	103	101	101	98	100	104	105	100	98	90
Armed Forces and Society	100	94	56	63	87	89	93	90	90	91	91	90	90	91	95	100
Human Ecology Review	101	84	75	102	105	98	87	103	101	102	101	97	99	101	104	100
Archives Europeennes de Sociologie	102	83	89	16	81	90	30	86	86	85	86	86	86	86	94	100
Sociological Spectrum	103	87	56	105	93	96	98	98	97	98	102	100	97	102	105	100
Sociologus	104	97	106	113	111	111	103	107	111	106	108	105	107	108	105	100
American Journal of Economics and Sociology	105	99	56	99	96	98	103	99	99	100	103	102	99	103	98	100
Revista Espanola de Investigaciones Sociologicas	106	111	102	92	99	109	103	107	107	108	104	105	111	104	105	100
Canadian Journal of Sociology-Cahiers Canadiens de Sociologie	107	89	48	106	112	102	100	104	104	104	105	105	102	105	105	100
Revista Internacional de Sociologia	108	115	106	103	104	109	110	109	108	108	108	110	112	108	105	100
Innovation	109	109	89	116	109	108	110	110	108	110	110	111	109	110	105	100
Society	110	110	106	108	115	107	110	111	110	112	112	113	108	112	105	100
Sotsiologicheskoe Issledovaniya	111	117	118	120	122	121	118	119	119	120	120	119	120	120	119	100
Sociologia	112	123	106	118	123	119	120	121	119	121	121	121	121	121	105	100
Mobilization	113	93	89	52	95	95	83	90	91	90	90	90	95	90	93	100
Economic and Social Review	114	100	89	109	100	103	103	105	105	105	106	108	103	106	105	100
Journal of Historical Sociology	115	103	83	107	113	113	110	111	111	110	111	111	113	111	105	100
Social Compass	116	107	75	96	107	106	109	106	106	106	107	109	106	107	98	100

Contributions to Indian Sociology	117	108	89	110	103	111	110	113	111	113	113	114	114	113	105	100
Deviance et Societe	118	113	75	114	114	114	116	114	114	115	115	115	115	115	105	100
Convergencia	119	120	118	115	117	118	122	119	119	117	118	117	117	118	119	119
Drustvena Istrazivanja	120	121	118	117	108	117	116	117	117	117	117	117	117	117	105	120
Telos	121	124	123	112	116	121	120	122	122	122	122	122	122	122	119	120
Current Perspectives in Social Theory	122	119	106	124	121	119	118	118	118	119	118	119	119	118	119	120
Eastern European Countryside	123	118	118	111	118	123	123	123	123	123	123	123	123	123	119	120

Table 8. Ranks of education science journals in single-indicator-based and aggregate rankings (journals are ordered by Journal Impact Factor)

	Journal Impact Factor	Article Influence Score	SNIP	H-index	SJR	Borda grades	Hare grades	Copeland 1 grades	Copeland 2 grades	Copeland 3 grades	Nanson grades	Duo-Simpson grades	Black grades	Inverse Borda grades	Threshold grade	Markovian method
Review of Educational Research	1	1	3	2	4	1	1	1	1	1	1	1	1	1	1	1
Educational Psychologist	2	4	29	5	7	4	3	4	4	4	2	2	4	2	3	2
Educational Research Review	3	15	29	1	12	10	3	8	8	8	8	9	9	8	2	2
Learning and Instruction	4	10	6	13	11	6	8	7	7	7	7	8	7	7	11	4
Journal of Research in Science Teaching	5	7	2	9	2	3	3	2	2	2	2	2	3	2	4	5
Educational Researcher	6	2	12	3	9	2	3	2	2	2	2	2	2	2	6	6
Science Education	7	9	12	11	3	7	9	6	6	6	6	7	6	6	5	7
Journal of the Learning Sciences	8	8	91	12	13	11	11	13	13	12	14	13	11	9	9	8
Journal of Engineering Education	9	46	1	31	1	21	1	9	8	9	8	2	12	9	13	9
Advances in Health Sciences Education	10	20	29	26	31	13	11	17	17	17	17	15	14	17	15	10
Computers and Education	11	32	12	10	17	9	3	11	11	12	11	14	10	12	10	11
Studies in Science Education	12	14	106	15	14	33	17	15	15	15	15	15	33	15	28	12
Scientific Studies of Reading	13	17	6	43	26	21	18	23	23	23	25	19	22	21	21	13
American Educational Research Journal	14	3	5	6	5	5	10	4	4	4	5	6	5	5	6	14
Sociology of Education	15	6	8	14	6	12	11	12	12	10	12	9	13	13	14	15
Journal of Teacher Education	16	13	8	4	10	8	11	10	8	10	8	9	8	9	8	16
Academy of Management Learning and Education	17	19	23	34	27	16	18	18	18	18	18	19	17	22	16	17

Early Childhood Research Quarterly	18	18	19	29	35	18	26	21	21	21	19	19	19	23	17	18
Internet and Higher Education	19	38	40	17	16	17	25	18	18	18	20	19	18	18	17	19
Educational Evaluation and Policy Analysis	20	5	23	22	8	14	11	13	13	14	13	9	15	14	12	20
Health Education Research	21	34	4	87	57	43	26	34	33	34	33	24	43	32	52	21
Language Learning and Technology	22	25	29	24	47	28	33	27	27	25	27	24	28	27	32	21
International Journal of Computer-Supported Collaborative Learning	23	27	106	23	18	19	26	20	20	20	21	23	20	19	17	21
Journal of School Health	24	52	40	72	59	40	26	49	48	49	40	31	40	42	56	24
Reading Research Quarterly	25	12	8	16	15	15	18	15	15	15	16	15	16	16	17	25
Teaching and Teacher Education	26	68	47	30	33	26	18	28	27	28	28	31	26	24	29	25
American Journal of Education	27	24	47	50	20	38	38	29	29	29	28	24	38	28	23	25
Physical Review Special Topics-Physics Education Research	28	67	75	51	95	56	40	52	52	52	53	54	56	54	57	25
International Journal of Science Education	29	43	40	46	38	27	40	31	30	32	36	37	27	36	32	25
Aids Education and Prevention	30	41	17	103	55	49	33	45	44	45	43	37	49	44	53	30
Thinking Skills and Creativity	31	98	57	20	97	78	33	74	74	74	74	60	78	74	86	30
Language Learning	32	22	47	40	21	20	39	21	21	21	22	24	21	25	22	32
Bmc Medical Education	33	74	40	63	79	55	48	62	62	62	59	60	55	58	57	33
Journal of American College Health	34	55	40	83	73	53	48	54	52	54	52	48	53	48	57	33
British Journal of Educational Technology	35	57	29	47	41	30	18	34	36	34	37	42	30	39	29	35
Metacognition and Learning	36	23	75	64	36	44	40	40	42	43	31	37	44	31	51	36
Reading and Writing	37	42	131	78	49	41	48	43	42	43	44	46	41	45	57	36
Chemistry Education Research and Practice	38	87	149	74	99	72	57	76	74	76	75	76	72	76	86	38
Environmental Education Research	39	82	149	52	70	54	63	58	57	58	59	60	54	61	41	38
Vocations and Learning	40	89	106	120	86	107	64	97	95	96	98	87	107	101	65	40
Studies in Higher Education	41	28	29	25	25	23	47	25	25	25	24	29	23	29	23	41
Research in Science Education	42	50	106	54	44	38	64	48	48	46	51	48	38	47	35	42
Academic Psychiatry	43	113	47	122	123	98	72	102	102	99	99	92	98	103	103	43

IEEE Transactions on Learning Technologies	44	81	57	7	64	56	18	57	57	57	57	54	56	59	35	43
Journal of Research in Reading	45	54	106	92	84	66	79	64	66	63	68	68	67	65	62	43
British Educational Research Journal	46	31	17	18	29	24	26	25	25	25	26	30	24	30	23	46
Economics of Education Review	47	30	75	56	39	32	48	32	32	33	38	42	32	40	50	47
Research in Higher Education	48	35	29	53	40	31	48	34	33	34	39	42	31	41	23	48
Instructional Science	49	39	23	39	37	29	48	30	30	31	33	37	29	35	23	48
Higher Education	50	65	29	35	46	37	57	46	44	46	45	48	37	49	40	50
Elementary School Journal	51	40	57	84	42	45	48	37	37	38	40	46	45	43	53	51
Harvard Educational Review	52	33	23	42	60	46	57	50	50	49	48	53	46	51	41	52
Journal of Higher Education	53	36	8	21	32	34	40	33	35	30	28	31	34	32	35	53
Journal of Computer Assisted Learning	54	49	12	19	22	25	11	23	23	23	23	24	25	20	39	54
Language Teaching Research	55	47	106	33	48	69	70	51	51	51	49	48	69	52	48	54
Journal of Educational and Behavioral Statistics	56	21	57	95	51	58	33	59	59	59	55	54	59	54	62	54
Journal for Research in Mathematics Education	57	26	75	37	24	47	46	40	37	34	32	31	47	32	35	57
Tesol Quarterly	58	59	19	90	69	62	80	64	66	63	68	60	63	65	65	58
Journal of Studies In International Education	59	51	75	48	68	51	72	54	52	54	58	59	51	60	47	59
Teaching Sociology	60	125	91	71	118	105	81	105	106	105	107	99	105	108	109	60
Minerva	61	61	91	73	61	60	91	68	66	67	59	60	61	67	65	60
Education Finance and Policy	62	16	149	125	43	67	26	54	52	54	54	48	58	50	53	62
Journal of Education Policy	63	45	29	36	28	34	48	38	37	39	45	31	34	36	41	62
Etrandd-Educational Technology Research and Development	64	56	19	28	34	36	57	40	40	40	45	37	36	46	41	64
Early Education and Development	65	73	131	109	85	73	64	69	66	69	70	72	73	70	65	65
Comparative Education Review	66	64	106	59	66	68	92	64	63	68	64	68	68	68	77	65
Quest	67	116	75	117	114	108	93	110	108	110	115	117	108	112	109	65
Review of Research in Education	68	11	57	8	45	41	18	39	41	40	40	15	41	26	29	68
System	69	72	57	69	87	64	72	70	70	69	71	72	64	71	65	68
Computer Assisted Language Learning	70	91	91	85	53	74	72	74	74	74	76	77	74	77	65	68

Australasian Journal of Educational Technology	71	101	75	89	67	70	40	77	77	77	78	78	70	79	88	68
Journal of Science Education and Technology	72	70	57	67	91	65	72	70	70	69	71	72	66	71	65	68
Review of Higher Education	73	29	57	45	19	47	33	44	46	42	33	31	47	36	32	68
Journal of Geography in Higher Education	74	139	75	146	155	134	93	137	132	136	130	118	134	117	104	68
Journal of Educational Research	75	66	57	107	102	80	81	79	79	79	79	81	80	80	89	68
International Journal of Educational Development	76	103	91	68	92	76	72	83	82	82	79	81	76	80	89	68
Asia-Pacific Journal of Teacher Education	77	86	75	94	75	85	107	84	87	82	83	81	85	85	77	68
Journal of Literacy Research	78	58	106	93	89	95	93	86	85	86	85	81	95	86	77	68
Second Language Research	79	44	131	58	62	79	64	60	59	60	59	60	79	62	77	79
Educational Technology and Society	80	95	47	49	63	60	26	60	59	60	59	54	61	54	46	80
European Journal of Teacher Education	81	99	106	88	72	82	106	81	81	82	82	81	82	84	94	80
Asia-Pacific Education Researcher	82	146	106	143	121	121	93	121	121	121	122	118	121	123	104	80
Higher Education Research and Development	83	75	91	62	50	59	71	64	65	63	66	60	59	63	65	80
Adult Education Quarterly	84	102	106	41	110	94	81	93	92	93	93	92	94	93	94	80
Journal of Curriculum Studies	85	94	19	55	76	81	93	80	80	79	84	78	81	80	77	80
Anthropology and Education Quarterly	86	63	106	97	105	93	112	92	90	90	94	98	93	87	94	80
Journal of Environmental Education	87	60	106	118	117	106	108	101	102	102	97	106	106	96	94	80
Foreign Language Annals	88	92	91	112	80	87	108	87	85	90	86	87	88	88	77	80
Research Papers in Education	89	84	106	77	124	100	123	106	106	106	101	106	100	99	94	89
British Journal of Sociology of Education	90	85	57	66	54	63	64	63	63	63	67	68	64	64	65	89
Interactive Learning Environments	91	90	106	86	65	77	81	78	78	77	77	78	77	78	65	89
Distance Education	92	100	106	38	88	83	72	85	83	85	88	91	83	90	77	89
Comparative Education	93	77	57	138	81	90	93	89	90	92	87	87	90	89	65	89
Educational Administration Quarterly	94	48	57	44	30	50	57	47	46	46	50	42	50	53	41	94

Journal of Diversity in Higher Education	95	80	106	132	71	104	93	94	97	94	101	106	104	93	77	95
Teachers College Record	96	37	29	57	52	51	57	52	52	52	56	54	51	57	57	95
Journal of Experimental Education	97	53	40	113	107	85	81	88	87	86	89	87	85	91	89	95
Gender and Education	98	122	23	82	82	90	110	94	94	96	94	92	90	96	94	95
Australian Educational Researcher	99	106	149	99	101	120	127	106	98	107	103	110	120	102	109	95
Health Education Journal	100	88	57	163	148	143	128	140	145	141	140	136	143	139	94	95
South African Journal of Education	101	147	106	91	142	122	112	122	122	122	124	125	122	125	109	95
School Effectiveness and School Improvement	102	71	106	60	23	70	40	73	73	69	65	60	70	69	62	95
Journal of Educational Computing Research	103	108	23	128	78	96	93	98	98	100	104	92	96	96	89	95
Urban Education	104	109	91	129	83	99	111	104	102	103	105	99	99	104	94	95
British Journal of Educational Studies	105	62	91	80	93	90	112	94	96	94	90	92	90	99	77	95
Reading Teacher	106	118	12	111	116	110	129	111	114	111	116	118	110	113	109	95
Teaching in Higher Education	107	83	149	65	58	74	81	72	72	73	73	68	74	73	65	95
International Journal of Inclusive Education	108	124	40	104	94	97	93	99	98	101	106	99	97	105	89	95
Journal of Philosophy of Education	109	130	75	81	98	113	126	111	108	111	108	110	113	109	109	109
Research in The Teaching of English	110	76	149	32	74	87	64	82	83	79	79	72	87	75	48	109
Educational Review	111	104	57	110	111	113	130	108	108	108	109	114	113	110	123	109
Race Ethnicity and Education	112	96	75	61	56	89	81	89	92	86	90	81	89	83	94	109
Oxford Review of Education	113	78	75	70	104	84	93	89	87	89	92	92	84	91	104	109
Teaching of Psychology	114	131	91	76	122	103	81	111	112	111	111	103	103	114	119	109
Theory into Practice	115	93	47	140	139	118	112	115	117	115	117	110	118	115	109	109
British Journal of Religious Education	116	143	131	27	103	127	48	116	115	117	110	114	127	118	109	109
Australian Journal of Guidance and Counselling	117	128	149	145	132	128	142	127	127	124	128	129	128	130	123	109
Journal of Baltic Science Education	118	155	165	166	164	159	150	157	156	157	159	158	159	159	123	109
Irish Educational Studies	119	123	75	126	96	113	124	116	117	116	118	106	113	116	123	109
Journal of Teaching in Physical Education	120	114	57	114	112	102	81	108	108	108	111	116	102	111	119	109

Studies in Continuing Education	121	137	57	106	109	134	130	130	127	130	120	118	134	121	123	109
Journal of Adolescent and Adult Literacy	122	126	47	149	129	123	93	122	122	122	123	125	123	124	119	122
Journal of Social Work Education	123	140	106	79	108	109	112	118	116	118	114	105	109	119	123	123
European Physical Education Review	124	110	91	148	138	126	130	128	127	127	131	130	126	131	123	124
Language and Education	125	120	165	127	120	116	112	120	120	120	121	124	116	122	123	124
Zeitschrift fur Soziologie der Erziehung und Sozialisation	126	158	131	119	115	148	150	143	142	143	142	141	148	147	165	124
Educational Gerontology	127	145	47	150	144	136	130	138	137	139	137	141	136	138	123	124
Educational Policy	128	79	75	124	100	100	93	103	102	103	100	103	100	106	104	124
Scandinavian Journal of Educational Research	129	115	75	121	133	117	112	124	124	124	126	118	117	125	123	124
Language Culture and Curriculum	130	144	165	102	127	140	150	138	132	137	132	140	141	128	123	124
History of Education	131	127	91	100	141	137	146	131	131	132	137	131	137	133	123	124
Asia Pacific Education Review	132	134	131	147	136	129	130	134	132	137	135	136	129	136	123	124
Cultura y Educacion	133	157	131	135	156	146	150	147	148	146	151	151	146	151	123	124
Education and Urban Society	134	121	131	161	150	147	145	148	149	148	151	146	147	142	123	124
Journal of Language Identity and Education	135	112	165	131	137	131	142	135	137	132	136	131	131	137	123	124
Egitim Arastirmalari-Eurasian Journal of Educational Research	136	159	131	165	170	164	158	159	159	159	160	160	164	160	123	124
Journal of College Student Development	137	105	29	136	106	112	81	111	112	111	111	110	112	107	119	124
Journal of Legal Education	138	161	131	155	166	160	167	159	159	159	161	160	160	161	165	124
Applied Measurement in Education	139	69	106	156	135	131	124	131	136	131	132	131	131	132	109	124
Educational Studies	140	129	106	144	134	129	130	133	132	134	128	131	129	133	123	124
English in Australia	141	166	131	137	128	157	161	159	159	159	153	153	157	152	165	124
Comunicar	142	164	149	152	167	161	164	163	163	163	162	160	161	164	123	124
Educational Research	143	119	57	139	125	124	112	125	125	127	127	125	124	127	123	124
European Journal of Education	144	117	106	75	119	119	112	119	117	118	118	118	119	120	123	124
Journal of Economic Education	145	107	47	116	130	125	130	126	126	124	125	125	125	129	123	124
Asia Pacific Journal of Education	146	133	131	160	147	148	147	152	150	152	143	146	148	139	123	124
Curriculum Inquiry	147	135	131	115	151	142	148	140	139	142	144	149	142	144	123	124

English Teaching-Practice and Critique	148	142	131	159	126	153	150	148	150	148	147	152	150	148	123	124
Journal of Moral Education	149	138	91	130	149	139	130	143	139	143	145	141	139	141	123	124
Innovations in Education and Teaching International	150	111	57	108	77	110	93	100	101	96	94	99	110	95	104	124
Studies in Philosophy and Education	151	132	149	96	131	131	130	129	130	129	132	131	131	133	123	124
Egitim ve Bilim-Education and Science	152	165	149	141	146	152	150	152	150	152	154	153	153	153	123	124
Paedagogica Historica	153	141	106	105	153	143	149	145	146	145	146	150	143	146	123	124
Cadmo	154	171	149	157	168	170	169	168	168	170	170	170	170	170	165	124
Music Education Research	155	150	172	98	90	140	112	140	142	140	137	136	140	142	109	124
Australian Journal of Education	156	136	149	101	113	137	142	135	139	135	140	139	137	144	123	124
Zeitschrift fur Padagogik	157	163	131	167	154	161	162	162	162	162	162	164	161	162	123	124
Zeitschrift fur Erziehungswissenschaft	158	148	131	158	152	151	150	154	153	154	155	155	152	155	123	124
International Journal of Art and Design Education	159	160	165	133	157	155	160	155	157	154	156	156	154	156	123	124
Education as Change	160	156	106	170	171	168	171	170	170	166	166	165	168	166	123	124
European Early Childhood Education Research Journal	161	153	131	134	145	145	130	146	144	146	148	146	145	150	123	124
Phi Delta Kappan	162	154	75	162	158	154	130	156	155	156	157	157	155	157	123	124
Revista de Educacion	163	151	149	123	162	158	158	158	158	157	158	158	158	158	165	124
Journal of Beliefs and Values-Studies in Religion And Education	164	152	170	164	169	164	170	165	165	165	164	165	164	165	165	124
Kuram ve Uygulamada Egitim Bilimleri	165	162	131	168	163	161	150	163	163	163	165	160	161	163	123	165
Educational Assessment Evaluation and Accountability	166	97	91	151	143	155	130	148	153	148	148	141	156	154	123	166
Educacion XX1	167	170	149	142	159	166	163	166	166	166	167	165	166	167	165	166
Educational Leadership	168	149	47	153	140	150	112	148	147	151	148	141	151	149	123	166
Ensenanza de las Ciencias	169	169	170	172	172	171	172	171	171	171	171	171	171	171	123	166
Revista Espanola de Pedagogia	170	168	149	154	161	167	166	168	168	169	169	169	167	169	165	166
KEDI Journal of Educational Policy	171	167	91	171	160	169	164	167	167	168	168	168	169	168	123	166
Movimento	172	173	172	169	165	172	167	171	171	171	171	171	171	171	123	166
Russian Education and Society	173	172	149	173	173	173	173	173	173	173	173	173	173	173	165	166

Table 9. Ranks of public administration science journals in single-indicator-based and aggregate rankings (journals are ordered by Journal Impact Factor)

	Journal Impact Factor	Article Influence Score	SNIP	H-index	SJR	Borda grades	Hare grades	Copeland 1 grades	Copeland 2 grades	Copeland 3 grades	Nanson grades	DuoSimpson grades	Black grades	InverseBorda grades	Threshold grade	Markovian method
Journal of Public Administration Research and Theory	1	2	1	5	1	1	1	1	1	1	1	1	1	1	1	1
Policy Studies Journal	2	6	8	24	9	6	9	6	6	6	6	6	6	6	26	2
Journal of Policy Analysis and Management	3	1	3	5	7	5	7	5	5	5	5	5	5	5	2	2
Public Administration	4	7	7	3	4	3	4	4	4	4	4	4	4	4	25	4
Journal of European Social Policy	5	4	2	11	3	2	3	3	3	3	3	3	3	3	3	4
Climate Policy	6	13	27	11	20	12	17	13	12	13	15	14	12	15	27	6
Journal of Social Policy	7	11	4	2	8	8	8	7	7	7	7	7	8	7	5	7
Governance	8	3	6	9	10	7	10	7	7	7	8	9	7	8	6	8
Policy Sciences	9	10	21	3	16	11	16	12	12	11	13	13	11	13	12	9
Public Management Review	10	14	16	24	19	14	20	18	18	18	18	14	14	18	14	10
Journal of European Public Policy	11	5	5	7	2	3	2	2	2	2	2	2	2	2	4	11
Regulation and Governance	12	8	9	30	13	9	13	9	9	9	9	10	9	9	10	12
Policy and Politics	13	21	22	16	24	21	24	22	22	22	22	22	22	22	19	13
Review of Public Personnel Administration	14	19	14	32	5	17	5	14	14	14	10	7	16	9	11	14
Environment and Planning C: Government and Policy	15	18	15	16	18	14	19	16	16	16	14	14	14	14	16	15
Public Administration Review	16	12	12	1	11	9	11	11	11	11	12	10	9	9	7	16
Social Policy and Administration	17	17	10	9	17	16	17	18	18	16	18	20	18	18	17	17
Journal of Accounting and Public Policy	18	22	11	11	14	17	14	17	17	18	16	14	18	16	12	18
Review of Policy Research	19	23	25	19	25	21	25	23	23	23	23	23	23	23	20	19
American Review of Public Administration	20	15	24	11	15	13	15	15	15	15	17	19	13	17	9	20
Public Administration and Development	21	25	19	19	27	24	27	24	24	24	24	24	24	24	28	21
International Review of Administrative Sciences	22	16	13	19	23	21	23	20	20	21	20	21	20	20	18	22
International Public Management Journal	23	9	20	24	6	19	6	10	10	10	11	10	17	12	8	23
Administration and Society	24	20	17	7	12	20	12	20	20	18	20	14	20	20	14	24
Public Money and Management	25	28	28	11	26	25	26	24	24	24	24	24	24	24	22	25
Canadian Public Policy/ Analyse de Politiques	26	26	26	28	29	27	29	27	27	27	28	27	27	27	23	25
Local Government Studies	27	29	23	28	22	26	22	26	26	26	26	26	26	26	21	27
Transylvanian Review of Administrative Sciences	28	34	32	32	30	31	30	29	29	29	31	30	31	30	31	28
Contemporary Economic Policy	29	24	29	19	31	29	31	29	29	29	29	31	29	31	29	29
Administration in Social Work	30	30	18	30	21	29	21	29	29	29	30	27	29	27	30	30
Australian Journal of Public Administration	31	27	30	19	28	28	28	27	27	27	27	27	28	27	23	31
Journal of Homeland Security and Emergency Management	32	31	34	34	34	34	34	34	34	34	34	34	34	34	34	32
Canadian Public Administration	33	32	31	24	32	32	32	32	32	32	32	32	32	32	32	32
Public Personnel Management	34	33	33	16	33	33	33	33	33	33	33	33	33	33	32	34
Reforma y Democracia	35	37	36	37	35	35	35	35	35	35	35	35	35	35	34	34

Gestion y Política Publica	36	35	35	34	36	36	36	36	36	36	36	36	36	36	34	36
Civil Szemle	37	38	37	37	37	37	37	37	37	37	37	37	37	37	37	37
Amme Idaresi Dergisi	38	36	38	36	38	37	37	37	37	37	37	37	37	37	37	37

Appendix 2

Journals excluded from the analysis

First stage of exclusion – journals with their Article Influence Score value missing

Sociology	Critical Studies in Education	Educational Philosophy and Theory
Information Communication and Society	Physical Education and Sport Pedagogy	Higher Education Policy
Du Bois Review-Social Science Research on Race	International Journal of Bilingual Education and Bilingualism	Educational Management Administration and Leadership
Food, Culture and Society	Journal of Computing in Higher Education	Literacy
Tempo Social: Revista de Sociologia da USP	Journal of English for Academic Purposes	Pedagogische Studien
Socio-Economic Review	ELT Journal	British Journal of Music Education
Sociological Methodology	International Review of Research in Open and Distance Learning	Research in Science and Technological Education
Biodemography and Social Biology	Science and Education	RIDE-The Journal of Applied Theatre and Performance
Research in Social Stratification and Mobility	Journal of Education For Teaching	Mathematical Thinking and Learning
Sociological Research Online	Educational Studies in Mathematics	Porta Linguarum
Chinese Sociology and Anthropology	International Journal of Science and Mathematics Education	English in Education
Education	Language Policy	Public administration
Journal of Research on Educational Effectiveness	Teachers and Teaching	Journal of Public Policy
Language Teaching	Discourse-Studies in the Cultural Politics of Education	Science and Public Policy
International Journal of Sustainability in Higher Education	Reading and Writing Quarterly	Lex Localis
Medical Education Online	Technology Pedagogy and Education	Policy and Society
ReCALL	Mind Culture and Activity	Journal of Comparative Policy Analysis
International Journal for Educational and Vocational Guidance	Cambridge Journal of Education	Policy Studies
	Compare-A Journal of Comparative and International Education	Nonprofit Management & Leadership
		Public Performance & Management Review

Second stage of exclusion – journals with their SNIP or SJR value missing.

Sociology	Learning Media and Technology
Kolner Zeitschrift fur Soziologie und Sozialpsychologie	Australasian Journal of Early Childhood
Zeitschrift fur soziologie	Hacettepe Universitesi Egitim Fakultesi Dergisi-Hacettepe University Journal of Education
Berliner journal fur soziologie	Revista Latinoamericana de Investigacion en Matematica Educativa-RELIME
Filosofija-Sociologija	Australian Journal of Adult Learning
Education	Journal of Hospitality Leisure Sport and Tourism Education
Mind Brain and Education	Croatian Journal of Education-Hrvatski Casopis za Odgoj i obrazovanje
Sport education and society	
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