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Short Communication

# First in, best dressed: The presence of order-effect bias in journal ranking surveys

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ABSTRACT

The purpose of this study is to test for the presence of order-effect bias in journal ranking surveys. Data were obtained from 379 active knowledge management and intellectual capital researchers who rated 25 journals on a 7-point scale. Five different versions of the survey instrument were utilized. Consistent with the cognitive elaboration model, the satisficing theory, and the Gricean maxim of orderliness, order-effect bias was observed in journal ranking surveys. Journals that appear in the beginning of the ranking list delivered to survey respondents consistently receive higher scores than journals at the end of the list. Overall, the position of the journal in the list explains over 10% of its score. Therefore, authors of journal ranking studies are recommended to use multiple versions of the survey instrument with randomized journal orders.



## 1. Introduction and purpose of the study

The purpose of this study is to empirically investigate the presence of order-effect bias in journal ranking surveys. The development of journal rankings is an important yet controversial issue affecting all academic disciplines. Several methods have been proposed and utilized in journal rankings: expert surveys (Lowry, Humphreys, Malwitz, & Nix, 2007), citation impact measures (Garfield, 1972, 1979), the publication power approach (Holsapple, 2008; Serenko & Jiao, 2012), the Uncitedness Factor (Egghe, 2010), and Author Affiliation Index (Cronin & Meho, 2008). Among them, expert survey has received widespread recognition because the obtained ranking list reflects the cumulative opinion of a representative group of active discipline researchers, journal readers, contributors, and stakeholders. Nevertheless, despite its growing use, the expert survey journal ranking method has several methodological limitations.

First, the ranking process is very subjective because respondents score each journal based on their perceptions of its quality rather than on objective measures of its scientific contribution and impact. Second, survey developers tend to use a combination of previously established ranking lists to construct their own list of journals that is forwarded to experts for evaluation. In this case, new journals which did not appear in previous ranking lists are still excluded from subsequent studies (Truex, Cuellar, & Takeda, 2009). Third, intra-institutional politics may affect raters' decisions because some respondents may over-rate outlets appearing in their internal institutional rankings (Adler & Harzing, 2009). Fourth, practitioners usually represent only a fraction of respondents yet they are an important group of stakeholders (Saha, Saint, & Christakis, 2003). Fifth, respondents often assign higher scores to journals they are familiar with instead of objectively assessing each journal's

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quality and impact (Serenko & Bontis, 2011; Walstrom, Hardgrave, & Wilson, 1995). Most importantly, the order in which journals are presented to the raters may have a confounding effect on the validity of the ranking process.

Order-effect bias, also referred to as response-order effect, primacy or recency order effect, information order bias, and position bias, appears in self-administered surveys when the order in which questions are presented influences respondents' answers (Schuman & Presser, 1996). Even though order-effect bias was discovered over half a century ago (Ferber, 1952), despite a few notable exceptions (e.g., see Diaz, Black, & Rabianski, 1996), it is rarely addressed in journal ranking surveys. For example, none of the six well-known ranking studies of management information systems journals officially published at the Association for Information Systems website[2] controlled for order-effect bias (Hardgrave & Walstrom, 1997; Lowry, Romans, & Curtis, 2004; Mylonopoulos & Theoharakis, 2001; Peffers & Ya, 2003; Walstrom et al., 1995; Whitman, Hendrickson, & Townsend, 1999). Instead, in these studies journal titles were presented to respondents in alphabetical order. However, there are several theories which demonstrate that respondents are likely to assign higher scores to journals appearing in the beginning of the ranking list and lower scores to journals at the end.

According to the *cognitive elaboration model*, the serial position in which an item, answer or question is presented (e.g., in the beginning, middle, or end of the questionnaire) determines the opportunity respondents have to consider this option (Sudman, Bradburn, & Schwarz, 2010). Specifically, it suggests that the primacy effect takes place, and respondents assign higher scores to items appearing in the beginning of the list because they have a greater opportunity to elaborate on them, as opposed to items placed at the end of the list (Israel & Taylor, 1990; Krosnick & Alwin, 1987).

In journal ranking surveys, respondents are expected to extend a great deal of mental effort to distinguish among multiple alternatives and submit the final ranking that best reflects their personal opinion. They have to recall various factors, including the quality of articles published in each journal, editorial board members, discussions with colleagues, citation impact factors, etc. (Rogers, Campbell, Louhiala-Salminen, Rentz, & Suchan, 2007; Serenko & Bontis, 2009). This is all done for purely intrinsic purposes (e.g., to contribute to science) or minor extrinsic rewards (e.g., to receive a copy of the final report). It is unarguable that many respondents are highly motivated and willingly engage in elaborate cognitive processes. However, *the satisficing theory* states that even highly motivated individuals may gradually lose their concentration during the ranking process, get distracted, feel burdensome, and become tired. Therefore, some may shift their response strategy and eventually engage in satisficing behaviour by compromising their standard and extending less mental energy (Krosnick, 1991). Particularly, they select the first response category that seems acceptable, skip journals requiring elaboration, endorse status quo, and fail to differentiate between titles that appear similar yet represent different journals (e.g., Journal of Global Business and International Journal of Global Business[3]). As a result, the primacy effect takes place, and journals appearing on top of the list are given better consideration and, therefore, obtain higher scores compared to the journals at the bottom.

In addition, the Gricean *maxim of orderliness* (Grice, 2000) proposes that people interpret verbal and written communication based on not only what is being said but also how it is being said. Specifically, the order of statements, sentences, or questions affects the recipient's interpretation of the speaker's preferences; order-effect bias appears because the recipient assumes that the speaker's preferred options always appear in the beginning (Elqayam, Ohm, Evans, & Over, 2010). The recipient perceives order bias as a persuasive device employed by the speaker to communicate his or her opinion. Accordingly, when survey respondents are presented with a list of journals which they need to rate to determine the top ones, they may subconsciously assume that the leading journals were placed in the beginning of the list and, therefore, rank them higher.

Order-effect bias has been observed in a variety of settings. For example, people believe that the first speaker is always more accurate and confident than subsequent speakers (Wright & Carlucci, 2011), and the order in which information is received creates bias in decisions of the active duty U.S. Navy officers (Perrin, Barnett, Walrath, & Grossman, 2001). On the one hand, order-effect bias should not occur in self-administered surveys. From the reciprocity or even-handedness perspective, journal raters are expected to score each outlet relative to all other outlets in the list (Ayidiya & McClendon, 1990; Schuman & Ludwig, 1983). In contrast to phone or face-to-face interviews, survey respondents have an unlimited amount of time to complete the questionnaire. They are supposed to scroll up and down the list, continuously adjust all scores, make the subsequent rating comparable to the previous one, and make an optimal decision. On the other hand, there is no evidence to suggest that the reciprocity or even-handedness effect is evident in journal ranking decisions when respondents evaluate the perceived quality, prestige or contribution of a number of scholarly journals. Therefore, this study proposes and answers the following research question:

> In journal ranking surveys, what is the impact of order in which journals are presented on the raters' perceptions of these journals' contribution to the field?

## 2. Methodology and results

In this study, the dataset was obtained through a survey of 379 active researchers in the field of knowledge management and intellectual capital (KM/IC). The purpose was to develop a ranking of 25 KM/IC scholarly peer-reviewed journals. To

[2] http://start.aisnet.org/?JournalRankings.
[3] These titles are used for illustrative purposes only.

**Table 1**
Results (see Appendix for journal titles).

| Journal title | Journal order # | Journal score | | Rho: journal position/score Spearman's correlation | Mean difference: first order # minus last order # | Mean difference: two first order #s minus two last order #s |
|---|---|---|---|---|---|---|
| | | Mean | Standard deviation | | | |
| | 11 | 0.787 | 1.500 | | | |
| | 18 | 0.964 | 1.656 | | | |
| actKM | 10 | 1.028 | 1.773 | −0.300 | 0.064 | 0.058 |
| | 15 | 0.831 | 1.531 | | | |
| | 16 | 0.734 | 1.447 | | | |
| | 15 | 1.493 | 1.927 | | | |
| | 19 | 1.675 | 2.090 | | | |
| EJKM | 20 | 1.493 | 1.978 | −0.616 | 0.261 | 0.131 |
| | 13 | 1.577 | 1.969 | | | |
| | 22 | 1.316 | 1.945 | | | |
| | 10 | 0.867 | 1.605 | | | |
| | 2 | 1.000 | 1.828 | | | |
| IC | 19 | 0.746 | 1.619 | −0.359 | 0.253 | 0.063 |
| | 5 | 0.620 | 1.356 | | | |
| | 25 | 0.747 | 1.506 | | | |
| | 21 | 0.893 | 1.737 | | | |
| | 15 | 0.928 | 1.659 | | | |
| IJKBD | 21 | 1.183 | 1.869 | −0.821 | 0.412 | 0.414 |
| | 7 | 1.310 | 1.856 | | | |
| | 1 | 1.595 | 2.109 | | | |
| | 1 | 1.053 | 1.739 | | | |
| | 12 | 1.169 | 1.886 | | | |
| IJKBO | 4 | 1.352 | 1.852 | −0.051 | −0.115 | 0.104 |
| | 11 | 1.028 | 1.732 | | | |
| | 11 | 1.241 | 1.848 | | | |
| | 17 | 1.120 | 1.823 | | | |
| | 8 | 1.434 | 2.013 | | | |
| IJKCCM | 18 | 1.183 | 1.900 | 0.000 | 0.168 | 0.006 |
| | 10 | 1.028 | 1.656 | | | |
| | 24 | 1.266 | 1.959 | | | |
| | 25 | 1.160 | 1.779 | | | |
| | 23 | 1.554 | 2.108 | | | |
| IJKL | 11 | 1.620 | 1.959 | −0.500 | 0.460 | 0.086 |
| | 22 | 1.014 | 1.703 | | | |
| | 20 | 1.266 | 1.953 | | | |
| | 6 | 2.547 | 2.238 | | | |
| | 25 | 2.084 | 2.280 | | | |
| IJKM | 16 | 2.577 | 2.215 | −0.600 | 0.462 | 0.664 |
| | 8 | 2.676 | 2.266 | | | |
| | 23 | 1.810 | 2.196 | | | |
| | 13 | 1.547 | 2.035 | | | |
| | 21 | 1.217 | 1.913 | | | |
| IJKMS | 25 | 1.239 | 1.808 | −0.462 | 0.026 | 0.139 |
| | 21 | 1.296 | 1.981 | | | |
| | 12 | 1.266 | 1.886 | | | |
| | 18 | 0.907 | 1.570 | | | |
| | 24 | 0.976 | 1.703 | | | |
| IJKSR | 12 | 1.155 | 1.969 | −0.100 | −0.027 | 0.111 |
| | 14 | 0.746 | 1.481 | | | |
| | 6 | 0.949 | 1.753 | | | |
| | 16 | 0.933 | 1.622 | | | |
| | 13 | 1.169 | 1.847 | | | |
| IJKSS | 24 | 0.606 | 1.419 | −0.900 | 0.366 | 0.394 |
| | 2 | 0.972 | 1.673 | | | |
| | 18 | 0.747 | 1.621 | | | |
| | 14 | 1.427 | 1.925 | | | |
| | 10 | 1.614 | 2.112 | | | |
| IJLIC | 17 | 1.282 | 1.806 | −0.564 | 0.065 | 0.199 |
| | 18 | 1.606 | 2.087 | | | |
| | 9 | 1.671 | 2.104 | | | |

Table 1 (*Continued*)

| Journal title | Journal order # | Journal score | | Rho: journal position/score Spearman's correlation | Mean difference: first order # minus last order # | Mean difference: two first order #s minus two last order #s |
|---|---|---|---|---|---|---|
| | | Mean | Standard deviation | | | |
| | 20 | 0.800 | 1.627 | | | |
| | 14 | 1.181 | 1.907 | | | |
| IJIKM | 2 | 1.225 | 1.980 | −0.900 | 0.580 | 0.312 |
| | 1 | 1.380 | 1.988 | | | |
| | 4 | 1.025 | 1.783 | | | |
| | 8 | 0.680 | 1.508 | | | |
| | 16 | 0.795 | 1.560 | | | |
| IUPJKM | 1 | 1.113 | 1.825 | −0.100 | 0.056 | 0.027 |
| | 25 | 0.944 | 1.611 | | | |
| | 14 | 0.823 | 1.662 | | | |
| | 23 | 2.027 | 2.348 | | | |
| | 11 | 2.205 | 2.546 | | | |
| JIC | 15 | 1.887 | 2.175 | −0.200 | 0.438 | 0.043 |
| | 6 | 2.465 | 2.472 | | | |
| | 21 | 2.557 | 2.500 | | | |
| | 2 | 1.960 | 2.153 | | | |
| | 4 | 2.470 | 2.365 | | | |
| JIKM | 13 | 1.803 | 2.201 | −0.600 | 0.157 | 0.121 |
| | 3 | 1.972 | 2.171 | | | |
| | 7 | 1.886 | 2.166 | | | |
| | 12 | 3.120 | 2.295 | | | |
| | 5 | 3.361 | 2.477 | | | |
| JKM | 23 | 3.324 | 2.413 | −0.600 | 0.537 | 0.329 |
| | 16 | 3.239 | 2.423 | | | |
| | 2 | 3.861 | 2.080 | | | |
| | 3 | 1.787 | 2.152 | | | |
| | 9 | 1.831 | 2.300 | | | |
| JKMP | 9 | 1.817 | 2.093 | −0.667 | 0.237 | 0.230 |
| | 20 | 1.549 | 2.076 | | | |
| | 17 | 1.595 | 2.048 | | | |
| | 19 | 1.093 | 1.890 | | | |
| | 17 | 1.060 | 1.790 | | | |
| KMDJ | 6 | 1.155 | 1.810 | −0.205 | 0.211 | 0.025 |
| | 19 | 0.944 | 1.672 | | | |
| | 15 | 0.899 | 1.758 | | | |
| | 9 | 0.840 | 1.661 | | | |
| | 6 | 1.434 | 2.025 | | | |
| KMEL | 3 | 0.958 | 1.643 | −0.600 | 0.118 | 0.243 |
| | 4 | 1.268 | 1.859 | | | |
| | 8 | 0.899 | 1.729 | | | |
| | 4 | 2.093 | 2.372 | | | |
| | 1 | 2.651 | 2.491 | | | |
| KMRP | 5 | 2.901 | 2.331 | −0.205 | 0.538 | 0.268 |
| | 24 | 2.113 | 2.447 | | | |
| | 3 | 2.899 | 2.499 | | | |
| | 24 | 1.427 | 2.008 | | | |
| | 22 | 1.590 | 2.078 | | | |
| KPM | 22 | 2.000 | 2.324 | −0.718 | 0.472 | 0.369 |
| | 23 | 1.324 | 1.881 | | | |
| | 10 | 1.899 | 2.176 | | | |
| | 5 | 1.573 | 2.068 | | | |
| | 7 | 1.928 | 2.235 | | | |
| LO | 14 | 2.254 | 2.253 | 0.500 | −0.328 | −0.327 |
| | 17 | 1.901 | 2.300 | | | |
| | 13 | 1.823 | 2.117 | | | |
| | 7 | 0.987 | 1.615 | | | |
| | 20 | 0.880 | 1.549 | | | |
| OJKM | 8 | 0.732 | 1.463 | 0.300 | −0.057 | −0.134 |
| | 9 | 1.197 | 1.687 | | | |
| | 5 | 0.823 | 1.678 | | | |

Table 1 (*Continued*)

| Journal title | Journal order # | Journal score | | Rho: journal position/score Spearman's correlation | Mean difference: first order # minus last order # | Mean difference: two first order #s minus two last order #s |
|---|---|---|---|---|---|---|
| | | Mean | Standard deviation | | | |
| | 22 | 1.240 | 1.859 | | | |
| | 3 | 1.892 | 2.274 | | | |
| VINE | 7 | 1.620 | 2.160 | −0.800 | 0.652 | 0.598 |
| | 12 | 1.662 | 2.070 | | | |
| | 19 | 1.076 | 1.859 | | | |
| Average | | | | −0.403 | 0.240 | 0.179 |

ensure equal representation of each ranked journal, 50 unique authors were randomly selected from each outlet (2008–2011 period). No discrimination criteria (e.g., authorship order, current position, etc.) were applied. Note that two journals had not been in-print long enough, and they had fewer than 50 authors each (25 and 20 authors). An email invitation to participate in an online journal ranking was sent to 1195 respondents, followed by two reminders. Respondents were presented with a list of 25 journals and asked to rank the overall contribution of each journal to the KM/IC discipline on the seven-point Likert-type scale. Five versions of the ranking lists were used with randomized journal orders. Respondents were assigned to survey versions randomly.

Out of 1195 emails, 112 bounced back. 379 surveys were received and used for analysis (yielding a 35% response rate). For each journal, the mean score of all responses was calculated. Several types of analyses were done. First, a MANOVA test revealed that there are some differences in the means of journal scores across the five different survey versions (Wilks' Lambda = 0.666, $p < 0.001$). Second, Spearman's non-parametric correlations were calculated for each journal between the order in which it appeared in the list and the mean score. Out of 25 correlations, 22 were negative with the average rho = −0.4 (see Table 1). Therefore, the closer to the bottom of the list the journal appears (i.e., the higher its order #), the lower its mean score is. Third, for each journal, the mean difference was calculated when the journal was placed the closest to the top of the list vs. when it was the closest to the bottom of the list. For example, in five versions of the survey, IC Journal was placed as #2, #5, #10, #19, and #25. In this case, the mean difference between order #2 and order #25 was obtained (i.e., mean for order #2–mean for order #25). Out of 25 values, 21 were positive with the average difference of 0.240, which reflects a 16% increase in scores for journals in the beginning of the list. A similar procedure was performed by combining two journals appearing closer to the top of the list vs. two journals appearing closer to the bottom. For example, for IC Journal, the following difference was obtained: (mean for order #2 + order #5) – (mean for order #19 + order #25). In case of ties (e.g., when the same journal was randomly assigned the same order # in two different versions of the survey), a conservative value as per the order-effect bias theory was selected. Again, 23 differences were positive with the average of 0.179, representing a 12% increase in scores for journals appearing closer to the top of the list. This suggests that journals placed in the beginning of the list were ranked higher in most cases.

Fourth, a visual inspection of the obtained ranking lists also confirmed that there is a positive relationship between the journal's place in the list and its ranking. For instance, VINE Journal occupied the 16th place when its order number was 19, but it jumped to the 7th place when its order number was 3. The most dramatic shift happed to IJIKM which jumped from the 23rd to the 11th place, or half-way up the list, when its order number moved up from the 20th to the 1st.

## 3. Implications and conclusions

The purpose of this study was to investigate the impact of the order in which journals are presented on the raters' perceptions of these journals' contribution to the discipline. For this, 379 active researchers in the knowledge management and intellectual capital discipline ranked 25 KM/IC journals. Five versions of the survey instruments were utilized with randomized journal orders. The results ultimately confirmed the existence of order-effect bias in journal ranking surveys.

Overall, it was concluded that consistent with the cognitive elaboration model, the satisficing theory, and the Gricean maxim of orderliness, order-effect bias is present in journal ranking surveys. This bias dramatically benefits journals placed on the top of the ranking list delivered to survey respondents. Whereas the role of each theory above and the related cognitive processes require further investigation, this study provides empirical evidence indicating that respondents over-rate journals appearing in the beginning of the list, and under-rate those at the bottom. The magnitude of the differences is somewhat shocking, with the overall mean difference of over 10%. The findings of this study potentially explain the discrepancy in ranking lists constructed with the use of expert surveys and citation impact measures. For example, a number of studies empirically demonstrated dramatic inconsistencies in the ranking positions of scholarly journals based on subjective (i.e., survey) and objective (i.e., citation impact) approaches (Kao et al., 2008; Lewison, 2002; Serenko & Dohan, 2011). It is likely that order-effect bias contributed substantially to the observed differences between the methods.

Nevertheless, this study does not disregard expert surveys as a rigorous journal ranking method. Instead, it suggests a methodological improvement to eliminate the confounding effect of order bias. The solution is relatively simple; develop several versions of the survey instrument with randomized title sequences (Perreault, 1975). Even though running multiple

versions of the same survey instrument increases operating costs and researchers' workload, it eliminates a critical confounding effect thereby improving the overall rigour of the ranking technique.

In conclusion, it is suggested that the authors of future journal ranking studies consider the findings reported in this paper to improve the rigour and wide acceptance of the generated journal ranking lists. The validity of the previously published survey-based ranking lists that employed only a single version of the questionnaire also requires further reassessment.

## Appendix. Journal titles (listed alphabetically)

| Abbreviation | Title |
|---|---|
| actKM | actKM: Online J. of Knowledge Management |
| EJKM | Electronic J. of Knowledge Management |
| IC | Intangible Capital |
| IJKBD | Intl. J. of Knowledge-Based Development |
| IJKBO | Intl. J. of Knowledge-Based Organizations |
| IJKCCM | Intl. J. of Knowledge, Culture and Change Management |
| IJKL | Intl. J. of Knowledge and Learning |
| IJKM | Intl. J. of Knowledge Management |
| IJKMS | Intl. J. of Knowledge Management Studies |
| IJKSR | Intl. J. of Knowledge Society Research |
| IJKSS | Intl. J. of Knowledge and Systems Science |
| IJLIC | Intl. J. of Learning and Intellectual Capital |
| IJIKM | Interdisciplinary J. of Info., Knowledge and Management |
| IUPJKM | The IUP J. of Knowledge Management (formerly The Icfai J. of Knowledge Management) |
| JIC | J. of Intellectual Capital |
| JIKM | J. of Info. and Knowledge Management |
| JKM | J. of Knowledge Management |
| JKMP | J. of Knowledge Management Practice |
| KMDJ | Knowledge Management for Development J. |
| KMEL | Knowledge Management & E-Learning: An Intl. J. |
| KMRP | Knowledge Management Research & Practice |
| KPM | Knowledge and Process Management: The J. of Corporate Transformation |
| LO | The Learning Organization |
| OJKM | Open J. of Knowledge Management |
| VINE | VINE: The J. of Info. and Knowledge Management Systems |

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