How Do Statisticians Perceive Statistics Journals?

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Since researchers and academic institutions are increasingly evaluated based on their publication record in peer reviewed journals, it is crucial to assess how the statistics community perceives statistics journals. This study presents four subjective quality metrics of statistics journals as expressed by different segments of statisticians. Based on a worldwide sample of 2,190 statisticians, our findings indicate that the research interest and geographic origin of the researcher have a significant impact on journal perceptions, which are highly correlated with a journal's total number of citations.

KEY WORDS: Journal rankings; Statistics research.

1. INTRODUCTION

The recognition and development of an academic institution depends heavily on its faculty's publication record in prestigious journals (Lane, Ray, and Glennon 1990). As a result, an increased emphasis is placed on publishing in refereed journals and promotion criteria rest heavily on the faculty's publication record (Gibbons 1990). In fact, not only is the publication record one of the criteria for selecting Fellows at the American Statistical Association (Bailar 1988), but it is also used to measure the productivity of countries and institutions for their contributions to statistics (Genest 1997). Genest measured institution and country research productivity based on the number of articles, number of authors, and page counts in 16 international journals publishing in statistical theory. Since he believed the selection of these journals to be "subjective and far from comprehensive," a study that systematically identifies the relevant journals would facilitate such studies. The need for identifying relevant journals was also demonstrated by Baltagi (1999) in his article on the ranking of individuals and institutions in applied econometrics. To demonstrate impact, Baltagi used page counts and citations of relevant articles from 15 journals, but could not control for journal quality since no journal quality measure was available. Although citation reports do provide an aggregate measure of a journal's impact, the perceptions of statisticians with different research interests may vary. In fact, in the UK where funds to universities are disbursed based on the Research Assessment Exercise (RAE), impact factors or citation indices are not used to assess research output in journals. Instead, the assessment of the RAE panel for statistics is based on the "perceived editorial standards of journals" (http://www.hero.ac.uk/rae/criteria/crit24.htm).

Despite the fact that the assessment of journals is a crucial issue for the research community, it is a surprise that the statistics community's perceptions have not been systematically examined. We therefore pose the following questions: What are the most popular journals in the field of statistics? Since promotion decisions frequently depend on the number of publications in top tier journals, how do statisticians classify journals in tiers? Besides one's perception about a journal's standing, how useful do researchers find a particular journal? Do statisticians from different research or geographic areas or with a different type of employment value journals differently? How do the subjective perceptions of journal quality relate to the more objective journal citation measures? By addressing these questions, this study seeks to assist: (1) authors in their search for a research outlet, (2) departments in promotion and tenure decisions, and (3) journal editors, by providing them a view of their journal's standing. We should note that while we examine the perceptual journal rankings, there is a substantial overlap in the quality of individual articles that appear in journals of vastly different reputation.

2. SURVEY INSTRUMENT AND METHODOLOGY

Since we sought to examine journal perceptions over a broad sample, we located four publicly available membership directories of statisticians (American Statistical Association, Institute of Mathematical Statistics, International Statistical Institute, and an online listing of UK-based academic statisticians, found at http://www.swan.ac.uk/statistics/das/). Due to the pervasive use of the Internet among statisticians, we developed an online survey. Our questionnaire requested from participants to place statistics journals in rank order and at the same time provide demographic information. The demographic variables were selected in order to be used as segmentation variables that could provide answers to the questions raised earlier. Therefore, participants were asked to rank up to ten statistics journals that they considered as top tier (most rigorous, prestigious, and important) and up to ten additional journals that they considered as second tier. In addition, respondents were asked to list up to ten journals that they considered to be most useful in their work. A list of 110 statistics journals was available on pull-down menus (Appendix), but respondents could also fill in any other journal

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Table 1. Respondents' Profile

Highest academic degree	
Doctorate	1734
Masters	355
Bachelor's	40
Other	24
No answer	37
TOTAL	2190
Type of employment	
Faculty member	1234
Government employee	185
Researcher/clinician at a health/medical facility	152
Manufacturing industry employee	121
Private consultant	101
Service industry employee	43
Retired	32
Actuary	3
Other	179
No answer	140
TOTAL	2190
Geographical location	
North America	1495
Europe	412
Asia	149
Latin America	57
Australia/New Zealand	37
Africa	23
No answer	17
TOTAL	2190

title they wished. From the directories identified, we collected the E-mail addresses of 12,053 statisticians and proceeded by sending an E-mail invitation to them for completing our online questionnaire (the questionnaire and full set of tables are available at www.alba.edu.gr/survey). The survey was pretested on a sample of 30 statisticians and minor alternations were made. Two weeks after the initial E-mail invitation, an E-mail reminder was sent to individuals who had not responded.

In total, we received 2,190 usable responses (521 from the second wave) with a usable response rate of 18.2%. No significant differences in the ranking of journals were found between first and second wave respondents, that is, those who responded to the reminder E-mail, which may indicate that our sample does not suffer from nonresponse bias. However, statisticians that do not believe in ranking journals, may have not participated. Nearly two-thirds of our respondents are from North America, more than half are faculty members, and nearly 80% of our respondents hold a doctorate (Table 1). Sixty seven percent of our respondents replied that their institution uses the number and/or character of journal publications for personnel decisions.

2.1 Measures of Perceived Quality

Previous studies on the ranking of journals in other disciplines have reported *Familiarity* and *Average Rank Position* as measures of perceived quality (Luke and Doke 1987; Hult, Neese, and Bashaw 1997). We measure the *Familiarity* of a journal by the percentage of respondents who placed the journal among their top 20 (*%Top20*), whereas *Average Rank Position* (ARP) refers to the mean of the ranking positions given by respondents who chose to rank the particular journal and is defined as follows:

$$\mathrm{ARP}_i = \frac{\sum_{j=1}^{20} R_{ij} * j}{\sum_{j=1}^{20} R_{ij}} \quad (1 \le \mathrm{ARP}_i \le 20), \tag{1}$$

where i denotes the journal and R_{ij} is the number of times journal i has been ranked in the jth position. Thus, a lower ARP denotes a higher perceived journal importance. In addition, we report the percentage of respondents who included the journal in their top ten with respect to the total number of respondents (*%Top10*) and journal *Usefulness* that corresponds to the percentage of respondents who listed the journal among the ones most useful in their work. But one has to be careful when ranking journals on any single measure of perceived quality. For example, if journal A is ranked by 100 respondents who all place it in the 1st first position and journal B is ranked by 101 respondents who all place it in the 20th position, then journal A would be ranked lower if journals were ranked based on Familiarity. In order to minimize such problems, we considered multiple quality measures when performing the ranking of journals, by using a weighted *Index* of familiarity and rank (Theoharakis and Hirst 2002) that is defined as follows:

$$\begin{aligned} \mathrm{Index}_i &= 100 * \frac{\sum_{j=1}^{20} R_{ij} * (21 - j)}{20 * n} \\ &= 100 * \frac{21 - \mathrm{ARP}_i}{20} * \%\mathrm{Top20}_i \\ &\quad (0 \le \mathrm{Index}_i \le 100), \end{aligned} \tag{2}$$

where i denotes the journal and R_{ij} is the number of times the journal i has been ranked in the jth position and n is the number of respondents in the sample. Thus, the Index assigns to the jth position a decreasing weight of $(21 - j)/20$, with the first rank position carrying a weight of 20/20 and the last (20th) position a weight of 1/20. We also extend the original Index by Theoharakis and Hirst (2002) to indicate its connection with ARP and %Top20. As we list the journals based on this Index, we present each individual measure and suggest that readers should examine each journal individually across the metrics presented.

3. RESULTS

We present journals based on the weighted Index of familiarity and rank for our worldwide sample and the two largest regional samples (Table 2). Although the correlations between our perceptual metrics (%Top10, %Top20, ARP, and Usefulness) are high (Table 3), the correlations of each one of these metrics with our Index are even higher; the only exception is the correlation of ARP with %Top10 that is about the same with the correlation of ARP with Index (this is not a surprise since %Top10 depends on rank position). This indicates that our Index is indeed a representative measure to conduct our ranking.

The *Journal of the American Statistical Association* (JASA), *Biometrika* (Bka), *The Annals of Statistics* (AoS), the Journal of the Royal Statistical Society, Series B (JRSB), and *Biometrics* (Bcs) are highly perceived across all quality metrics by our worldwide and regional samples. These journals are closely followed by *Technometrics* (Tech), the *Journal of the Royal Statistical Society, Series A* (JRSA), *Statistics in Medicine* (SMed), the *Annals of Probability* (AoP), and *The American Statistician*

Table 2. Journal Rankings Based on Geographical Location

	Worldwide (n = 2,190)					North America (n = 1,495)					Europe (n = 412)				
Rank	Journal	INDEX	% Top10	% Top20	Usefulness	ARP	Journal	INDEX	% Top10	% Top20	Usefulness	ARP	Journal	INDEX	% Top10	% Top20	Usefulness	ARP
1	JASA	74.00	80.73	85.30	58.65	3.65	JASA	76.64	82.68	86.56	61.17	3.29	JASA	65.22	73.06	78.88	51.83	4.46
2	Bka	56.61	65.48	72.69	40.57	5.43	Bka	54.59	63.48	69.70	38.99	5.33	JRSB	60.28	68.20	75.97	41.88	5.13
3	AoS	51.74	58.22	64.52	26.70	4.96	AoS	48.21	54.72	60.27	23.33	5.00	Bka	58.82	66.99	76.21	38.74	5.56
4	JRSB	50.46	59.91	64.84	32.00	5.44	JRSB	46.42	55.99	60.00	27.78	5.53	AoS	55.95	61.17	70.15	31.15	5.05
5	Bcs	42.00	45.57	58.77	38.13	6.71	Bcs	43.19	47.42	58.60	40.45	6.26	Bcs	36.83	38.59	54.13	32.20	7.39
6	Tech	29.79	32.37	47.58	20.31	8.48	Tech	31.70	34.92	48.96	21.49	8.05	JRSA	29.50	32.28	47.82	16.23	8.66
7	AmSt	28.07	23.56	47.72	33.92	9.23	AmSt	31.59	26.89	52.31	38.53	8.92	ApSt	25.81	26.46	40.53	22.77	8.26
8	JRSA	24.22	26.71	38.77	8.88	8.51	JRSA	23.40	26.22	36.79	6.75	8.28	AoP	23.85	26.21	34.47	11.26	7.16
9	SMed	20.57	21.42	32.42	26.91	8.31	SMed	21.80	22.88	33.85	29.32	8.12	Tech	22.99	23.54	41.26	14.14	9.86
10	AoP	20.47	21.96	29.68	7.64	7.21	AoP	18.04	19.20	26.29	5.91	7.28	SMed	20.39	20.87	33.50	24.08	8.83
11	ApSt	18.98	18.04	32.37	15.22	9.28	SSci	17.29	19.00	29.10	17.88	9.11	SJS	19.24	17.96	40.29	10.99	11.45
12	SSci	17.13	18.58	29.32	17.97	9.31	ApSt	16.88	15.99	29.03	12.89	9.37	AmSt	18.03	14.56	33.74	20.42	10.31
13	Ecnt	13.70	14.98	22.01	7.22	8.55	Ecnt	12.22	13.38	19.60	5.37	8.53	SSci	17.26	18.20	29.37	14.40	9.25
14	JMA	12.32	11.74	25.07	8.52	11.17	CJS	11.07	6.69	25.69	4.60	12.38	JMA	16.44	15.05	32.52	10.21	10.89
15	CSTM	11.01	7.95	23.33	9.61	11.56	CSTM	10.74	7.36	23.08	8.75	11.69	Ecnt	15.39	16.75	24.51	10.47	8.45
16	CJS	10.92	6.30	25.84	4.73	12.55	JMA	9.98	9.36	20.54	6.52	11.28	Bern	14.67	14.32	25.49	8.90	9.49
17	JSPI	10.54	8.49	22.97	8.73	11.82	JSPI	8.88	7.22	19.20	7.14	11.75	JSPI	13.13	9.95	27.91	10.47	11.59
18	SJS	10.00	8.45	22.69	5.61	12.18	Bsts	8.64	6.29	16.19	10.44	10.33	ISR	12.86	12.86	24.03	10.21	10.29
19	AnAP	9.61	10.00	15.66	6.44	8.73	AnAP	8.58	8.83	13.71	5.07	8.49	TStt	12.34	9.22	26.70	13.09	11.75
20	Ssin	8.21	7.49	17.40	4.99	11.57	JCGS	8.50	7.36	16.72	8.67	10.84	SPL	10.69	8.98	23.30	12.83	11.82
21	JCGS	8.01	6.80	15.89	8.05	10.92	Ssin	8.44	7.96	17.26	5.30	11.22	AnAP	10.47	11.17	17.96	7.85	9.34
22	Bsts	7.98	5.98	15.21	9.30	10.51	Chnc	7.86	4.55	16.32	8.44	11.37	CJS	9.84	5.34	24.03	4.71	12.81
23	ISR	7.57	6.62	16.03	6.18	11.56	AJE	7.28	6.09	12.91	11.28	9.72	PTRF	9.83	11.65	15.53	8.12	8.34
24	Bern	7.34	6.71	13.74	4.16	10.32	Psyc	7.16	7.36	14.25	4.45	10.95	AAP	8.47	7.52	15.78	8.38	10.26
25	AJE	6.85	5.75	12.28	10.29	9.84	SJS	6.94	5.48	16.52	3.84	12.60	SPA	8.42	8.98	13.35	9.16	8.38
26	Psyc	6.70	6.80	13.42	4.47	11.01	JQT	6.84	6.56	10.90	9.67	8.45	JAP	8.40	8.25	15.53	7.59	10.19
27	SPL	6.68	5.16	15.98	7.74	12.64	JAS	6.10	5.55	12.37	4.53	11.14	CSTM	8.14	5.58	17.23	7.07	11.55
28	AISM	6.53	5.71	12.65	4.26	10.67	SnkA	5.82	5.69	12.51	2.30	11.69	CSDA	7.77	5.34	17.96	9.42	12.35
29	Chnc	6.30	3.61	13.61	7.06	11.74	ISR	5.49	4.48	12.17	4.14	11.98	JCGS	7.32	5.58	15.05	6.54	11.27
30	AAP	6.22	5.80	11.19	4.47	9.88	CSDA	5.41	3.88	12.37	6.14	12.25	JTSA	7.00	4.85	16.26	7.59	12.39
31	CSDA	6.12	4.57	13.84	7.64	12.15	CSSC	5.37	2.94	12.71	4.68	12.55	Bsts	6.53	5.10	13.59	7.59	11.39
32	SnkA	6.12	5.80	13.11	2.55	11.66	AISM	5.32	4.62	10.03	2.76	10.40	AISM	6.21	4.85	14.56	4.19	12.47
33	JAS	6.12	5.43	12.83	5.51	11.47	CCT	4.93	4.48	9.16	9.21	10.23	Psyc	6.00	6.07	11.41	4.71	10.49
34	JAP	5.99	5.98	11.14	4.94	10.25	JBES	4.90	4.62	10.17	5.45	11.36	JEcn	5.92	6.80	9.95	5.76	9.10
35	TStt	5.98	4.75	13.70	6.65	12.27	AAP	4.89	4.55	8.70	2.69	9.76	JAS	5.72	5.10	12.62	6.81	11.94
36	PTRF	5.62	6.39	9.54	4.52	9.22	Bern	4.67	4.15	9.23	2.38	10.88	SMMR	5.32	4.85	9.22	6.02	9.47
37	JQT	5.61	5.30	9.32	8.05	8.97	SPL	4.61	2.94	12.31	4.14	13.51	Ssin	5.18	4.13	12.38	1.83	12.63
38	JTSA	5.12	4.25	11.64	5.30	12.20	JAP	4.41	4.41	8.36	2.92	10.45	AJE	5.18	4.85	8.74	8.38	9.14
39	JEcn	4.94	5.07	8.77	5.04	9.72	JEcn	4.37	4.41	7.69	4.37	9.63	SnkA	4.94	3.64	11.41	1.83	12.34
40	CSSC	4.84	2.79	11.51	4.21	12.60	TStt	4.36	3.55	10.17	3.99	12.43	SC	4.85	4.13	10.68	6.02	11.91

Table 3. Perceived Measure Correlations

	INDEX	%Top10	%Top20	Usefulness
%Top10	0.996			
%Top20	0.982	0.966		
Usefulness	0.951	0.936	0.941	
ARP	−0.799	−0.802	−0.784	−0.770

(AmSt) which is the fourth most useful journal worldwide. In order to have some idea if a difference in the Index values between journals is significant, we calculated the standard errors for each journal's Index. For our worldwide sample, the average standard error for journals with an Index greater than 13 ranges from .61 to .89 (mean of .75) while for those with an Index less than 13 ranges from .32 to .53 (mean of .42).

Some significant differences in journal rankings appear between North American and European statisticians. On one hand, North American statisticians rank higher the *Journal of Computational and Graphical Statistics* (JCGS), *Communications in Statistics, Part A–Theory and Methods* (CSTM), *Canadian Journal of Statistics* (CJS), *Biostatistics* (Bsts), *Psychometrica* (Psyc), *Statistica Sinica* (Ssin), the *American Journal of Epidemiology* (AJE), and *Sankhya*, Series A (SnkA). On the other hand, Europeans perceive highly the *Scandinavian Journal of Statistics* (SJS), *Bernoulli* (Bern), the *International Statistical Review* (ISR), *The Statistician* (TStt), *Statistics and Probability Letters* (SPL), *Probability Theory and Related Fields* (PTRF), *Advances in Applied Probability* (AAP), *Stochastic Processes and their Applications* (SPA), *Journal of Applied Probability* (JAP), and *Journal of Time Series Analysis* (JTSA). These differences in ranking can be explained either by a geographical bias, that is, Americans favor American journals and Europeans favor European journals, or by differences in the research interests of the two populations in our sample. A higher percentage of European researchers are interested in mathematical statistics, Bayes methods, probability, and stochastic processes, with respect to the corresponding percentage of American researchers. Thus, European researchers tend to favor journals related to

Table 4. Journal Rankings Based on Employment Type

	Academics with PhD (n = 1149)			Government (n = 185)			Remaining statisticians (n = 856)		
Rank	Journal	INDEX	% Top10	Journal	INDEX	% Top10	Journal	INDEX	% Top10
1	JASA	77.16	84.77	JASA	77.86	84.32	JASA	68.94	74.53
2	Bka	64.88	74.85	Bka	51.68	60.00	Bka	46.57	54.09
3	AoS	64.14	72.67	JRSB	42.30	51.89	Bcs	42.51	46.96
4	JRSB	60.21	71.37	Bcs	39.38	45.41	JRSB	39.13	46.26
5	Bcs	42.05	44.56	AoS	37.73	42.16	AoS	38.11	42.29
6	Tech	30.30	32.72	AmSt	36.89	32.43	AmSt	33.98	29.79
7	AoP	26.24	28.55	JRSA	30.08	35.68	Tech	31.21	34.23
8	JRSA	23.74	25.33	SMed	20.27	21.62	SMed	25.13	27.22
9	AmSt	22.25	17.49	Tech	20.00	21.62	JRSA	23.59	26.64
10	SSci	20.54	22.37	ApSt	19.95	16.76	ApSt	18.30	18.11
11	ApSt	19.33	18.19	JOS	16.43	15.68	AoP	14.58	15.19
12	Ecnt	18.52	20.63	SSci	15.27	15.68	SSci	12.97	14.14
13	SMed	17.21	17.06	SrvM	14.27	14.59	JQT	8.50	8.29
14	JMA	17.18	16.10	AoP	11.89	12.43	AJE	8.32	7.59
15	JSPI	14.74	11.58	Ecnt	11.84	11.89	Chnc	8.30	5.49
16	SJS	13.92	11.84	ISR	11.54	10.81	CSTM	7.84	6.19
17	CJS	13.91	7.57	Chnc	9.89	4.86	Ecnt	7.64	8.06
18	CSTM	13.55	9.57	CSTM	9.89	5.95	TStt	7.46	6.19
19	AnAP	13.12	14.10	AJE	9.84	9.73	JMA	7.39	7.48
20	Bern	10.84	10.10	CJS	9.73	7.03	JAS	7.28	7.01
21	Ssin	10.27	9.31	Bsts	9.35	7.03	CJS	7.16	4.44
22	SPL	9.95	8.18	JBES	7.46	8.65	Bsts	7.01	4.91
23	JCGS	9.77	8.18	JAS	6.84	7.57	JCGS	6.38	5.49
24	PTRF	9.33	10.70	JSPI	5.76	3.78	Psyc	6.27	6.89
25	JAP	8.80	9.14	CSDA	5.70	4.86	Ssin	6.02	5.72
26	AAP	8.60	8.01	TStt	5.57	4.32	ISR	6.02	5.84
27	AISM	8.58	7.48	Ssin	5.46	4.32	JSPI	5.94	5.37
28	Bsts	8.48	6.61	SJS	5.30	3.78	CCT	5.86	5.26
29	ISR	8.09	6.53	AnAP	5.24	4.86	AnAP	5.83	5.61
30	Psyc	7.39	7.22	CSSC	4.92	3.24	SJS	5.77	4.91
31	JTSA	7.25	5.74	JMA	4.86	4.32	SnkA	5.47	5.26
32	JEcn	7.15	7.22	JCGS	4.59	4.32	CSDA	5.06	4.21
33	SnkA	7.01	6.70	JEcn	4.46	4.86	JBS	4.94	4.32
34	CSDA	6.98	4.79	Psyc	4.43	3.78	AISM	4.60	3.97
35	SPA	6.89	7.40	SMMR	3.92	3.78	SMMR	4.25	3.74
36	JBES	5.91	5.48	IJE	3.76	3.78	AAP	4.10	3.86
37	CSSC	5.40	2.87	JABE	3.76	2.70	CSSC	4.06	2.57
38	AJE	5.28	3.74	SnkB	3.70	3.24	BJnl	3.95	2.57
39	JAS	5.13	3.92	AoE	3.68	2.70	SnkB	3.93	4.09
40	TStt	4.94	3.74	CCT	3.68	3.24	QE	3.77	3.62

Table 5. Journal Rankings of Ph.D. Academics Based on Research Area

	Biometrics/biostatistics (n = 207)			Econometrics (n = 62)			Remaining Ph.D. academics (n = 880)		
Rank	Journal	INDEX	% Top10	Journal	INDEX	% Top10	Journal	INDEX	% Top10
1	JASA	85.22	95.65	JASA	84.11	91.94	JASA	91.64	81.70
2	Bcs	75.14	85.99	Ecnt	70.73	82.26	AoS	84.84	75.00
3	Bka	74.52	86.47	AoS	69.44	77.42	Bka	84.48	71.82
4	JRSB	68.02	83.09	Bka	65.89	79.03	JRSB	78.87	68.75
5	AoS	51.43	61.35	JEcn	58.55	64.52	Bcs	60.02	37.27
6	SMed	48.74	52.17	JRSB	54.92	69.35	Tech	52.86	33.18
7	Tech	31.74	34.30	JBES	39.44	40.32	AoP	44.63	33.18
8	JRSA	31.30	34.30	ET	37.90	40.32	AmSt	42.60	16.82
9	AmSt	26.98	21.74	JRSA	27.82	33.87	JMA	39.97	18.64
10	ApSt	26.76	27.05	RES	24.52	24.19	JRSA	39.38	22.61
11	SSci	25.68	30.43	JTSA	22.74	19.35	CJS	37.23	7.61
12	Bsts	25.14	22.22	AoP	22.26	25.81	SSci	37.23	21.48
13	SJS	14.64	13.04	JAE	20.73	19.35	JSPI	35.68	12.84
14	CSTM	14.44	8.21	AmSt	19.68	12.90	SJS	34.72	11.82
15	AJE	14.37	10.14	Tech	18.39	20.97	ApSt	34.48	17.27
16	CJS	14.08	9.18	Bcs	16.21	9.68	CSTM	29.71	10.23
17	Ecnt	13.45	14.01	JMA	14.44	11.29	SPL	28.52	9.43
18	JSPI	11.79	8.70	ER	14.11	9.68	Ecnt	27.80	17.84
19	AoP	10.53	9.66	CSTM	11.45	4.84	AnAP	26.97	17.61
20	JCGS	10.10	7.73	ApSt	9.44	1.61	Bern	24.94	12.73
21	CCT	9.66	8.21	IJF	8.31	6.45	Ssin	24.70	10.23
22	Ssin	9.42	7.73	SJS	8.06	8.06	SMed	23.51	9.89
23	CSDA	9.35	7.73	SSci	7.82	8.06	JCGS	21.36	8.64
24	JMA	9.06	6.76	JFor	6.85	4.84	AISM	21.00	9.09
25	ISR	8.96	7.25	SPL	6.29	4.84	PTRF	20.88	13.86
26	SMMR	6.86	4.83	CJS	6.21	1.61	JAP	19.93	11.48
27	LDA	6.71	5.31	Psyc	5.97	6.45	AAP	19.45	9.77
28	CSSC	6.69	1.93	SnkA	5.40	4.84	ISR	19.21	6.59
29	JAS	6.28	5.80	EcxJ	5.16	0.00	SnkA	18.85	7.95
30	BJnl	6.16	1.45	ISR	5.16	3.23	JTSA	18.73	5.91
31	Psyc	5.31	3.86	SPA	5.08	3.23	CSDA	16.59	4.20
32	SPL	4.93	3.86	JSPI	4.84	3.23	Psyc	16.59	8.07
33	JSCS	4.78	3.86	CSSC	4.76	4.84	SPA	15.63	9.43
34	TStt	4.78	3.38	SnkB	4.44	4.84	SnkB	14.68	3.98
35	JABE	4.23	3.38	AISM	4.19	3.23	CSSC	13.60	2.95
36	Envr	3.94	2.90	CSDA	4.19	3.23	TStt	13.24	4.09
37	AnAP	3.67	2.90	JNS	4.19	1.61	JAS	12.89	3.75
38	ANZJ	3.67	1.45	JAP	3.39	3.23	JNS	12.89	2.84
39	Chnc	3.26	0.97	SN	3.39	3.23	ANZJ	12.53	2.50
40	IJE	3.07	1.93	JCGS	3.23	3.23	Chnc	11.69	2.39

Mathematics, Probability and Stochastic Processes (e.g., Bern, SPL, PTRF, SPA, JAP).

A close examination of these rankings reveals that although some journals are ranked lower they appear to have relatively good conditional rank (low ARP). This suggests that a subset of respondents hold a very different view than the whole group. In particular, this behavior appears to arise in the case of probability and econometrics journals, which is consistent with previous findings where a significant cultural difference was found between probabilists and statisticians (Genest 1999). This observation prompts us to examine segments of our sample with research areas that might favor probability and econometrics journals.

3.1 Journal Rankings Based on Employment

Besides differences in perspective due to the geographical location of respondents, we examine the ranking of the two largest groups based on the type of employment. In particular, we focus on academics with a doctorate and government employees (Table 4). Since academics with a Ph.D. constitute more than half of our worldwide sample, their rankings demonstrate similarities with our worldwide sample. Government employees on the other hand, demonstrate a higher appreciation towards the *Journal of Official Statistics* (JOS) and *Survey Methodology* (SrvM). This is not as a surprise since the largest portion of statisticians interested in official statistics and survey methodology are government employees.

3.2 Journal Rankings Based on Research Area

The previous rankings based on geography and type of employment indicated that the underlying research areas of respondents did influence the overall ranking. We therefore proceed by examining the ranking of two subgroups of Ph.D. academics based on their self-reported research areas (Table 5). Ph.D. academicians interested in Biometrics/Biostatistics rank higher *Biometrics* (Bcs), *Biometrika* (Bka), *Statistics in Medicine* (SMed), *Biostatistics* (Bsts), *American Journal of Epidemiology* (AJE), and *Controlled Clinical Trials* (CCT). Moreover, researchers in this area find *Biometrics* more useful to their work than the

Table 6. Journal Rankings Based on Research Area (all respondents)

	Applications of statistics (n = 273)			Mathematical statistics (n = 169)			Bayes methods (n = 93)		
Rank	Journal	INDEX	% Top10	Journal	INDEX	% Top10	Journal	INDEX	% Top10
1	JASA	74.93	80.59	AoS	85.92	92.90	JASA	91.67	95.70
2	Bka	52.38	60.81	JASA	74.62	85.80	JRSB	74.68	86.02
3	JRSB	45.66	54.58	Bka	66.33	74.56	Bka	73.66	84.95
4	AoS	40.59	45.42	JRSB	59.29	71.01	AoS	68.71	74.19
5	Bcs	38.81	43.96	AoP	34.70	38.46	Bcs	41.08	40.86
6	Tech	37.55	40.66	JMA	34.35	32.54	SSci	32.26	32.26
7	AmSt	36.98	34.80	Bcs	30.74	27.22	Tech	30.11	30.11
8	JRSA	27.11	30.04	JSPI	29.53	27.22	ApSt	22.69	21.51
9	ApSt	24.29	23.08	AISM	24.26	23.08	CJS	19.84	8.60
10	SSci	18.90	19.78	Bern	24.08	23.08	JCGS	19.46	13.98
11	SMed	16.25	16.48	SJS	22.57	21.89	AoP	18.06	19.35
12	AoP	14.67	15.75	SSci	21.45	23.08	JSPI	16.94	10.75
13	Ecnt	11.61	12.82	Tech	21.39	21.89	JRSA	16.72	13.98
14	CSTM	11.28	9.52	Ecnt	21.30	21.89	SMed	15.32	12.90
15	JQT	11.10	10.62	SPL	20.12	17.16	Ecnt	15.16	18.28
16	Psyc	10.40	10.99	CJS	18.61	10.65	AmSt	14.52	12.90
17	JAS	9.73	9.16	AmSt	17.37	12.43	SJS	14.41	12.90
18	Chnc	9.71	6.23	AnAP	15.98	14.79	Ssin	14.03	9.68
19	TStt	9.14	7.69	PTRF	15.80	17.16	JMA	14.03	16.13
20	AnAP	8.66	8.06	CSTM	15.56	13.61	SnkA	10.81	9.68
21	JSPI	8.06	6.96	JRSA	14.82	13.02	AnAP	8.28	8.60
22	JMA	7.73	7.69	SnkA	13.34	13.02	TStt	8.17	5.38
23	CJS	7.66	3.66	Ssin	13.14	12.43	Bern	8.06	7.53
24	JCGS	7.05	5.49	JAP	13.08	13.02	JTSA	8.06	5.38
25	ISR	6.41	5.49	ApSt	12.19	10.06	Bsts	7.63	4.30
26	CSDA	6.14	5.49	AAP	9.29	8.28	SnkB	7.15	3.23
27	Bsts	6.10	3.66	SPA	8.28	9.47	JEcn	6.83	6.45
28	SJS	5.46	3.30	SMed	8.25	7.10	CSTM	6.77	3.23
29	SnkA	5.27	5.86	ISR	8.17	7.10	SPL	6.67	3.23
30	Ssin	5.13	4.76	TPA	7.81	7.10	ISR	6.29	5.38
31	AAP	5.05	5.49	ANZJ	6.89	5.33	JBES	5.91	3.23
32	CSSC	4.96	3.30	SnkB	6.86	6.51	SC	5.27	3.23
33	AISM	4.87	5.49	JTSA	6.78	3.55	AISM	4.73	3.23
34	BJnl	4.65	2.56	JCGS	6.48	4.73	JAP	4.03	4.30
35	SnkB	4.62	4.76	JNS	6.21	4.73	Psyc	3.92	3.23
36	AJE	4.14	2.56	Mtka	5.18	4.73	JABE	3.76	1.08
37	SPL	3.97	3.30	JAS	4.73	2.96	AAP	3.55	2.15
38	JAP	3.66	3.66	CSDA	4.41	2.37	CSDA	3.49	2.15
39	QE	3.46	2.56	CSSC	4.35	2.96	JFor	3.39	3.23
40	SMMR	3.42	2.93	Stat	4.29	3.55	JAS	3.33	3.23

Journal of the American Statistical Association (JASA). On the other hand, Ph.D. academicians interested in econometrics naturally appreciate *Econometrica* (Ecnt), that they place in the second position and find as useful as JASA, but find the *Journal of Econometrics* (Jecn) as the most useful journal. This group demonstrates a preference for the *Journal of Business and Economics Statistics* (JBES), *Journal of Time Series Analysis* (JTSA), *Review of Economics & Statistics* (RES), the *International Journal of Forecasting* (IJF), and the *Econometrics Journal* (EcxJ).

Further, we examine the journal perceptions of several groups of researchers based on their research area and independently of their employment type (Table 6). We find that researchers involved in the applications of statistics perceive more highly the *Journal of Quality Technology* (JQT), *Psychometrika* (Psyc), the *Journal of Applied Statistics* (JAS), *The Statistician* (TStt), and *Quality Engineering* (QE). Mathematical statisticians rank *Annals of Statistics* (AoS) in the first place across all metrics, seem to prefer theoretical journals, and highly value the *Journal of Multivariate Analysis* (JMA), *Journal of Statistical Planning and Inference* (JSPI), *Annals of the Institute of Statistical Mathematics* (AISM), *Bernoulli* (Bern), and *Probability Theory and Related Fields* (PTRF).

Bayes methods statisticians have become heavily computationally oriented using Markov chain Monte Carlo analyses and rank higher the *Journal of Computational and Graphical Statistics* (JCGS), the leading computational statistics journal, along with *Sankhya* Series A and Series B (SnkA and SnkB) and the *Journal of Time Series Analysis* (JTSA). Researchers interested in survey methodology rank higher the *Survey Methodology* (SrvM), that they find to be the most useful journal, the *Journal of Official Statistics* (JOS), *Journal of Business and Economics Statistics* (JBES), and *The Statistician* (TStt).

Table 6. (continued) Journal Rankings Based on Research Area (all respondents)

	Survey methodology (n = 86)			Probability (n = 63)			Stochastic processes (n = 56)		
Rank	Journal	INDEX	% Top10	Journal	INDEX	% Top10	Journal	INDEX	% Top10
1	JASA	78.49	83.72	AoP	80.48	88.89	AoS	77.59	87.50
2	Bka	50.23	59.30	AoS	58.65	73.02	AoP	67.32	78.57
3	JRSB	46.45	55.81	PTRF	51.51	68.25	JASA	48.66	53.57
4	AmSt	40.52	36.05	AnAP	48.97	71.43	Bka	47.05	51.79
5	SrvM	38.31	39.53	SPA	38.65	60.32	AnAP	44.02	51.79
6	AoS	33.43	39.53	AAP	36.98	60.32	JRSB	43.04	50.00
7	JOS	33.08	31.40	JAP	31.83	50.79	SPA	42.59	50.00
8	JRSA	31.34	38.37	JASA	30.08	44.44	AAP	36.34	37.50
9	Bcs	28.55	29.07	JTP	29.52	44.44	JAP	35.27	39.29
10	ISR	20.29	19.77	Bka	28.10	44.44	PTRF	34.64	42.86
11	Tech	17.79	18.60	Bern	27.14	42.86	JRSA	29.55	28.57
12	Chnc	13.37	9.30	AIHP	26.98	47.62	Bern	27.50	26.79
13	CJS	12.79	8.14	EJP	22.78	36.51	Bcs	22.68	19.64
14	ApSt	12.56	9.30	JMA	22.78	42.86	SPL	21.07	21.43
15	SSci	12.50	9.30	TPA	20.16	36.51	TPA	16.34	16.07
16	Ecnt	9.83	11.63	SPL	19.68	36.51	AIHP	15.71	14.29
17	AoP	9.19	9.30	JRSB	16.19	28.57	JMA	15.45	14.29
18	SnkB	8.55	8.14	SSci	12.38	20.63	SJS	15.09	12.50
19	CSTM	7.56	4.65	ECP	12.30	23.81	CSTM	14.91	12.50
20	SMed	7.56	8.14	JRSA	11.83	25.40	JTSA	11.34	8.93
21	AJE	7.27	5.81	JSPI	11.35	22.22	JTP	11.16	10.71
22	SJS	7.03	3.49	RSA	10.16	17.46	Tech	10.45	10.71
23	JBES	6.34	5.81	CJS	9.37	23.81	CJS	8.21	1.79
24	TStt	6.05	5.81	Bcs	7.86	19.05	ApSt	7.95	3.57
25	SnkA	5.81	4.65	SnkA	7.86	14.29	SSR	7.68	7.14
26	JSPI	5.29	2.33	MPRF	7.30	19.05	SM	7.68	3.57
27	Ssin	5.00	3.49	SSR	6.90	14.29	ASMD	7.32	3.57
28	JMA	4.94	4.65	AmSt	6.51	17.46	SAA	7.14	5.36
29	ANZJ	4.42	2.33	Tech	6.51	11.11	AISM	6.79	5.36
30	JAS	4.19	4.65	CSTM	6.43	15.87	AmSt	6.70	3.57
31	Bsts	4.01	3.49	AISM	6.35	12.70	SSci	6.52	7.14
32	CSSC	3.90	1.16	Ecnt	5.56	11.11	Envr	5.18	5.36
33	AISM	3.72	4.65	PEIS	5.00	7.94	Ssin	5.18	3.57
34	Psyc	3.72	3.49	JTSA	4.13	9.52	SA	5.09	5.36
35	AnAP	2.50	2.33	TPMS	3.97	7.94	JSPI	5.00	3.57
36	JABE	2.44	1.16	MF	3.89	7.94	Ecnt	4.91	3.57
37	JSCS	2.44	2.33	Ssin	3.81	7.94	MPRF	4.82	1.79
38	JCGS	2.38	1.16	JAS	3.57	7.94	TPMS	4.64	3.57
39	JFor	1.98	2.33	ISR	3.49	7.94	FS	4.55	3.57
40	AoE	1.98	1.16	FS	3.17	9.52	SnkA	4.46	1.79

Our examination of the worldwide rankings indicates that probability journals appear to be appreciated by an underlying segment of the population. More specifically, when examining statisticians interested in probability and statisticians interested in stochastic processes, the *Annals of Probability* (AoP) and *The Annals of Statistics* (AoS) share the leading positions. Although differences exist between these two groups, in general we find JASA ranked noticeably lower and not as useful while *Probability Theory and Related Fields* (PTRF), *Annals of Applied Probability* (AnAP), *Stochastic Processes and Applications* (SPA), *Advanced Applied Probability* (AAP), the *Journal of Theoretical Probability* (JTP), and the *Statistics and Probability Letters* (SPL) are ranked higher.

3.3 Perceptions Versus Objective Criteria of Journal Ranking

Apart from examining the perceptions about statistics journals, we also considered the relationship between worldwide journal perceptions and journal citations. We therefore calculated the correlations of our worldwide sample Index with the *Total Cites* and *Impact Factor* (Total Cites adjusted for the number of articles published in the two previous years) of the 54 statistics journals included in the 2001 ISI Journal Citation Reports. The correlation between Total Cites and Index is .84, whereas the correlation between Impact Factor and Index is .56. Although the Impact Factor appears to be more meaningful as it was developed to eliminate the bias towards large journals over small ones and older versus new ones, our results indicate that journal perceptions are more closely related to the total number of citations. One explanation might indeed be that perceptions are influenced by a journal's volume of publication rather than its impact. But before arriving at such a conclusion and given that we observe significant differences in journal perceptions among segments of statisticians, one may reconsider the use of citation measures provided by ISI; these measures do not focus on citations found in the statistics literature or the specific research area within statistics, but include any citation source available. This concern has been raised by other disciplines that have addressed the issue by conducting citation studies using as the source for

citations the most relevant journals of the discipline rather than all available journals in a database (Alexander and Mabry 1994).

4. CONCLUSIONS

The results of this survey shed some light on the perceptions of statistics journals worldwide. Findings indicate that although a leading set of journals is highly perceived, journal perceptions differ considerably depending on the statistician's specific geographical origin, research interests and employment type. In addition, while some journals may not be perceived as top tier journals overall, they are indeed useful to researchers from specific research areas. Furthermore, we found that subjective journal perceptions are more related with a journal's total number of citations rather than its citations impact factor. This is an issue that needs to be further examined by performing a citation analysis using as the source of citations only journals relevant to the particular area of statistics.

APPENDIX: JOURNALS

Acronym	*Journal name*
AAP	Adv Applied Probability
AJE	Amer J of Epidemiology
AmSt	The American Statistician
AIHP	Ann de l'Institut Henri Poincare
AISM	Ann Inst Statistical Mathematics
AnAP	Ann of Applied Probability
AoE	Ann of Epidemiology
AoP	Ann of Probability
AoS	Ann of Statistics
ASMD	Appl Stoch Models & Data Anal
ApSt	Applied Statistics
ANZJ	Austr & New Zeal J of Statistics
Bern	Bernoulli
BJnl	Biometrical Journal
Bcs	Biometrics
Bka	Biometrika
Bsts	Biostatistics
CJS	Canadian J of Statistics
Chnc	Chance
CSSC	Commun Statist - Simul Comput
CSTM	Commun Statist - Theor Meth
CSDA	Comput Statistics & Data Anal
CmpS	Computational Statistics
CCT	Controlled Clinical Trials
DMKD	Data Mining Knowl & Discovery
DS	Decision Sciences
ER	Econometric Reviews
ET	Econometric Theory
Ecnt	Econometrica
EcxJ	Econometrics Journal
ECP	Electronic Commun Probability
EJP	Electronic J of Probability
EES	Environmental & Ecological Statist
Envr	Environmetrics
ESPS	ESAIM: Probability & Statistics
FS	Finance & Stochastics
IJE	Intl J of Epidemiology
IJF	Intl J of Forecasting
ISR	Intl Statistical Review
JABE	J Agric Biol & Environ Statistics
JBES	J Bus & Economic Statistics
JASA	J of Amer Statistical Assoc
JAE	J of Applied Econometrics
JAP	J of Applied Probability
JAS	J of Applied Statistics
JBS	J of Biopharm Statistics
JChm	J of Chemometrics
JCls	J of Classification
JCGS	J of Comput & Graph Statistics
JEcn	J of Econometrics
JEBS	J of Educ & Behav Statistics
JFor	J of Forecasting
JKSS	J of Korean Statist Soc
JMA	J of Multivariate Analysis
JNS	J of Nonparametric Statistics
JOS	J of Official Statistics
JQT	J of Quality Technology
JRSA	J of Royal Statist Soc, Ser A
JRSB	J of Royal Statist Soc, Ser B
JSCS	J of Statist Comput & Simul
JSPI	J of Statist Planning & Inference
JSS	J of Statistical Software
JSE	J of Statistics Education
JTP	J of Theoretical Probability
JTSA	J of Time Series Analysis
LDA	Lifetime Data Analysis
MPRF	Markov Proc & Related Fields
MF	Mathematical Finance
MCAP	Meth & Comput in Appl Probability
Mtka	Metrika
NAAJ	North Amer Actuarial J
PEIS	Prob in Enginrg & Informational Sci
PTRF	Probability Theory & Rel Fields
Psyc	Psychometrika
QE	Quality Engineering
QP	Quality Progress
ROSE	Random Opratrs & Stoch Equns
RSA	Random Structures & Algorithms
RES	Review of Econ & Statistics
RA	Risk Analysis
SnkA	Sankhya, Series A
SnkB	Sankhya, Series B
SAJ	Scandinavian Actuarial J
SJS	Scandinavian J of Statistics
SA	Sequential Analysis
SJSC	SIAM J Scientific Computing
SASJ	South African Statistical J
SISP	Statist Inference for Stoch Proc
SMMR	Statist Methods in Medical Rsrch
SN	Statistica Neerlandica
Ssin	Statistica Sinica
StaM	Statistical Modelling
SP	Statistical Papers
SSci	Statistical Science
Stat	Statistics
SC	Statistics & Computing
SD	Statistics & Decisions
SPL	Statistics & Probability Letters
SMed	Statistics in Medicine
SAA	Stochastic Analysis & Applic
SM	Stochastic Models
SPA	Stochastic Proc & Applications
SSR	Stochastics & Stochs Reprts
SrvM	Survey Methodology

TS	Teaching Statistics
Tech	Technometrics
Test	Test
TStt	The Statistician
TPA	Theory Probab & Applications
TPMS	Theory Probab & Math Statistics

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