Intelligence 67 (2018) 26–32

Contents lists available at ScienceDirect

Intelligence

journal homepage: www.elsevier.com/locate/intell

Bibliometric analysis across eight years 2008–2015 of *Intelligence* articles: An updating of Wicherts (2009)

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A B S T R A C T

I update and expand upon Wicherts' (2009) editorial in *Intelligence*. He reported citation counts of papers published in this journal from 1977 to 2007. All these papers are now at least a decade old, and many more new articles have been published since Wichert's analysis. An updated study is needed to help (1) quantify the journal's more recent impact on the scientific study of intelligence, and (2) alert researchers and educators to highly-cited articles; especially newer ones. Thus, I conducted a bibliometric analysis of all articles published here from 2008 to 2015. Data sources included both the Web of Science (WOS), and Google Scholar (GS). The eight-year set comprised 619 articles, published by 1897 authors. The average article had 17.0 (WOS), and 32.9 (GS) citations overall (2.75, and 5.33 citations per year, respectively). These metrics compare favorably with those from other psychology journals. In addition, a list of the most prolific authors is provided. Also reported is a list showing many articles in this set with counts greater than one hundred, and an updated top 25 list for the history of this journal.

1. Introduction

Intelligence experienced its fortieth birthday in 2017. Founded by Douglas K. Detterman, the aim was to create the first scientific journal devoted to basic research in the field of intelligence (Detterman, 1977; see also Wicherts, 2009). The journal now ranks favorably on several measures of quality, including perhaps the most widely used and regarded metric, the journal impact factor (JIF; Garfield, 1955).

As evidence of *Intelligence*'s quality, Wicherts (2009) conducted a bibliometric study of all regular articles published in the journal between 1977 and 2007. Of these 797 articles, the median number of citations was 10, with a mode of 4. Wicherts (2009) also provided evidence that the journal's impact factor (3.27 in 2008) had been steadily rising over a twelve-year period.[1] Lastly, Wicherts (2009) included a top 25 list showing the journal's classic papers. These had total citations ranging from 81 to 492 counts. It was noted that any of these 25 articles would be appropriate as course materials for college instructors, and that many of these articles are “must reads” for researchers interested in the field of intelligence.

The occasional bibliometric study of a journal is important for several reasons (see, e.g., Sengupta, 1992; Thelwall, 2008). First, bibliometric analyses serve to update the field on what topics have generated the most short- and long-term interest from the research community. These analyses also: (a) provide historical records of where the field has been at a given point in time, (b) quantify the relative impact a journal is making toward illuminating the field it represents, and (c) alert researchers and educators to highly-cited work (or to newer articles with already impressive citation counts).

My goal is to update and expand upon the analysis Wicherts (2009) reported. Specifically, Wicherts (2009) examined articles published between 1977 and 2007. Even the most recent of these are now a decade old, and 619 new articles (through 2015; see below) have been published since 2008. I therefore coded all published articles (except book reviews) appearing in *Intelligence*, from the years 2008 to 2015. I present bibliometric analyses of citations (overall, and then adjusted per year) for each article, and then for its authors. Both the Web of Science (WOS) and Google Scholar (GS) were employed as data sources. Finally, I compare citation counts here with those reported for psychology journals “overall,” and for psychology journals in the same category as *Intelligence* (psychology, multidisciplinary).

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[1] The impact factor has leveled off somewhat since 2008. For the eight years following 2008, the average impact factor for this journal has been 3.03 (SD = 0.20), versus Wicherts' reported value of 3.27 for 2008.

https://doi.org/10.1016/j.intell.2018.01.001
Received 5 December 2017; Received in revised form 11 January 2018; Accepted 11 January 2018
0160-2896/

Table 1
Central tendency values and correlation matrix for the article set's citation counts (overall and per year), obtained from the Web of Science (WOS) and Google Scholar (GS).

Variable	*M* (*SD*)	Median	Mode	1	2	3	4	5
1. WOS overall	17.0 (22.5)	10.0	6	–	0.91	0.97	0.87	− 0.41
2. WOS per year	2.75 (3.00)	1.89	0.00		–	0.88	0.95	− 0.15
3. GS overall	32.9 (45.9)	19.0	11.0			–	0.91	− 0.40
4. GS per year	5.33 (6.17)	3.52	1.41				–	− 0.14
5. Publication year	–	–	–					–

Notes. $N = 619$. Citation values are as of October 31, 2017.

2. Method

I picked up where Wicherts (2009) left off. That is, on October 31, 2017, I coded all articles published in *Intelligence* (except book reviews) from 2008 to 2015. I did not include articles from 2016 or 2017, as I thought they were too new to fairly compare their citation counts with those for the older articles in the set. The result was 619 coded articles. These articles had between two and nine years with which to be cited. This range also seemed too large for fair comparisons across older and newer articles. Therefore, I created citations-per-year values by dividing each article's overall citation count by (2017.83 minus the year the article was published). I used 2017.83, because October 31 represents 83% of the number of days in a year.

For each article, I coded its title, overall citations from WOS and GS, and first seven authors. Regarding the authors, I followed American Psychological Association convention. That is, if an article listed more than seven authors, I coded the first six authors, and then reserved the "seventh author" spot for the paper's last author. Later, I present analyses by author, including how many had published multiple articles in the set, plus a list of the most prolific authors in this journal from 2008 to 2015.

Finally, statistical analyses were mostly descriptive. However, and as displayed in Wicherts (2009; Fig. 2), citation distributions tend to be substantially non-normal. The fact that citation distributions tend to be heavily skewed has been known for some time in the scientometrics literature (see, e.g., Aksnes & Gunnar, 2004; Garfield, 1987; Selgen, 1997). So, whereas I report both means and medians below to describe data, tests of average differences across variables feature only medians.

3. Results

3.1. Analysis by article

3.1.1. All recent articles

A total of 619 articles comprised the article set. Very large correlations existed across WOS and GS data sources, and across citations overall and citations per year (Table 1). For example, overall WOS and GS citations correlate 0.97 with each other (see Amara & Landry, 2012, for similar, scientometric findings in the business management literature). Likewise, correlations between overall citations and citations per year are in the .90s. Note, however, that only the overall citation counts correlate with time since publication (− 0.41 for WOS data, and − 0.40 for GS data). The correlation between citations per year and time since publication is only − 0.15, and − 0.14, respectively. Adjusting by time since publication allows for the identification of newer papers with already impressive citation rates—see below.

Fig. 1 is a frequency distribution of WOS overall citation rates.[2] As expected, the distribution is skewed and leptokurtic. That is, the distribution has a markedly "fat" right tail (consistent with the bibliometric literature cited above regarding the skewed nature of citation distributions).

Table 1 shows central tendency values for WOS and GS overall citations, and then for citations per year. Except for the modes, it appears that GS reported about twice as many citations as did WOS (see Franceschet, 2010, for similar findings in the computer science literature). To illustrate the magnitude difference here, only (a) two (0.3%) of the 619 articles in the set had higher WOS over GS citation counts, and (b) 26 (4.2%) of the 619 articles, had identical counts across WOS and GS. I next conducted a Wilcoxon Signed Rank Tests on the medians for citations overall in Table 1. The resulting Z value was 21.09, $p < 0.0001$. The effect size was large; $r = 0.60$. In sum, GS values here are roughly twice that of WOS values, this difference is large, and I return to it in the discussion.

How do the counts above compare to those Wicherts (2009) reported? Recall that he analyzed 797 articles published between the years 1977 and 2007. He reported a WOS median citation value of 10, which is exactly what was found here. He also reported four as the overall citations' mode whereas the value here is six. Additionally, Wicherts reported 25 articles with zero citations (3.1%). The present data set had 22 (3.6%). Finally, Wicherts reported 17 articles with 100 or more citations (2.2%); whereas, the present data set had only seven (1.1%). This is likely due to the age difference in the articles across data sets.

A final notable difference between the two data sets is that *Intelligence* has seen an explosion in the number of published articles across time. Wicherts analyzed 797 articles published over 30 years (26.57 articles per year, on average). I analyzed 619 more recent articles, published over 8 years (77.4 articles per year, on average). The publication rate has approximately tripled across the two sets. In fact, this trend exists even within just the present data set. The correlation here between year of publication (2008–2015) and the number of articles published is 0.77. A potential explanation for the increase is the founding (and then growth) of the International Society for Intelligence Research in 2000, wherein many of the abstracts presented at the yearly conferences are thereafter submitted to the journal for publication.[3]

How do citation counts for this journal compare to those from other outlets in psychology? Thomson Reuters (2011) reported WOS citation averages for all "psychology/psychiatry" articles published between 2000 and 2010. The reported mean was 11.26 (versus 17.00 here). Likewise, Iglesias and Pecharromán (2007) also calculated WOS citation averages for all "psychology/psychiatry" articles, but for the years 1995 to 2005. Their mean citation value was 8.24 (versus 17.00 here). In addition, I coded citation counts for all journals in the WOS "psychology, multidisciplinary" category for the years 2008–2015. This is the category *Intelligence* falls in. Table 2 shows the results of this analysis.

For each of the eight years displayed in Table 2, *Intelligence* has higher citation counts relative to the average of all other journals in the category. In fact, the final row in the table shows the citation counts averaged across the years 2008–2015. For the entire timeframe, Intelligence accumulated 39.4% (i.e., 19.1/13.7) more citations, relative to the average for all other journals in this category. In sum, the citation rates for *Intelligence* are relatively large, but they have not changed much since Wicherts' (2009) analysis.

3.1.2. Top 15 recent articles

Table 3 shows the top fifteen, recent (i.e., post Wicherts, 2009) articles with the most citations in the set. The table is a reflection of high impact papers now, or at least more recently, relative to what Wicherts reported. It includes overall citations, and then citations per

[2] The GS distribution looks identical in shape, and so is not displayed here.

[3] As suggested by a reviewer.

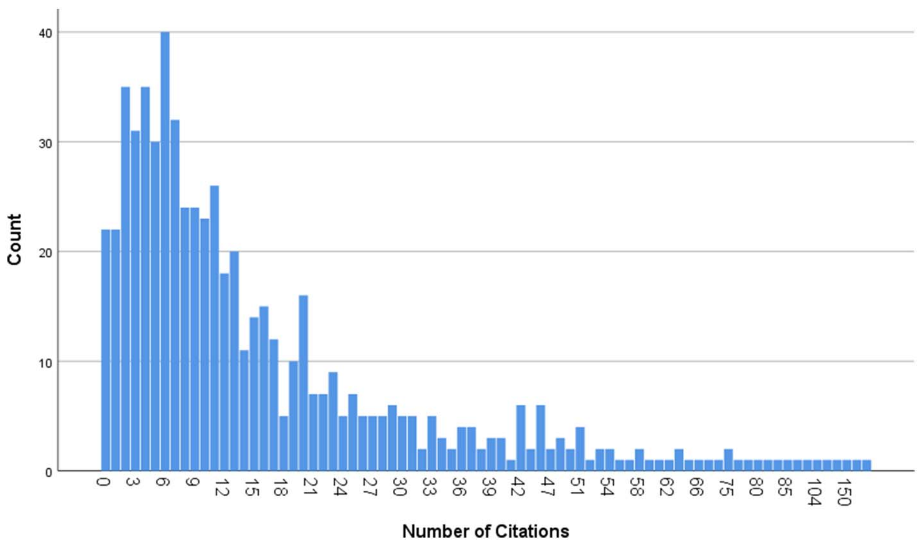

Fig. 1. Web of Science Overall Citations Count by $N = 619$ Articles in the Set.

Table 2
Web of Science citations per year for the journal, *Intelligence*, versus those for all other journals in the "psychology, multidisciplinary" category.

Year	*N* articles, *Intelligence*	*N* articles, all other journals	*M* citations, *Intelligence*	*M* Citations, all other journals	Citation difference
2015	106	9756	5.98	3.68	2.30
2014	122	7939	8.27	7.10	1.17
2013	85	7518	14.34	9.84	4.50
2012	63	6632	16.97	12.13	4.84
2011	50	6416	19.72	15.65	4.07
2010	62	5855	24.80	19.43	5.37
2009	70	5490	28.20	20.03	8.17
2008	61	5042	34.20	21.92	12.28
Means	77.4	6830.8	19.1	13.7	5.3

Note. Including *Intelligence*, there are 131 journals in this category.

year. Because both values are reported, the table actually lists 20 articles total (to get the ranks up to 15 each). Of note is that the McGrew (2009) paper ranks first on all four categories in the table.

The articles making the lists were somewhat (but not strikingly) different across overall citations, versus citations per year. A good example is the Hambrick et al. (2014) paper on deliberate practice. It is relatively new for articles in this set, and did not make the WOS top 15 list for overall citations. It ranked fifth, however, on WOS citations per year. Another example of this difference is the Benedek, Jauk, Sommer, Arendasy, and Neubauer (2014) paper, which did not make either the WOS or GS overall citations lists, but placed sixth on both citations per year lists. Nonetheless, I predicted more obvious differences in ranks on the lists for citations overall versus citations per year. This mostly did not happen.

The content of the top articles in the table varies interestingly across papers. For example, the table includes an article on atheism, another on delay discounting, and another on a reversal of the Flynn Effect. Conversely, many of the articles in the list focus on working memory, and three articles are on creativity. The range of topics displayed in the table reinforces the fact that this journal is multidisciplinary.

3.2. Analyses by recent authors

The 619 articles in the post-Wicherts set had 1897 authors. Many of these authors, though, published multiple articles in this journal. Namely, of the 1897 authors, 830 (44%) represent a researcher's second or more paper. As such, there were just 1067 unique authors publishing here from 2008 to 2015. The mean number of authors per paper was 3.07 ($SD = 1.72$), with 121 of the 619 articles (20%) being solo-authored. Finally, fully 324 (52%) of the 619 papers in this set contribute to the authors' i10-indicies (i.e., have citations of at least ten).

Table 4 shows publication counts by the number of unique authors (1067) in the set. Most researchers (70%) authored just one article. The range, however, extends from one up to 43 published articles. The latter was Ian Deary, who appeared as an author/coauthor on an impressive 7.0% of the 619 articles analyzed here. There were also 18 authors with eight or more articles in the set. That is, these authors published at least one article per year (on average) in this journal from 2008 to 2015. Table 5 shows publication counts and citation metrics for these 18, most published authors in the set.

Of note in Table 5 is that these 18 authors produced fully 270 publication counts. Also, the WOS/GS correlation here is 0.97, which is the exact value found for the entire set of articles. Finally, average authorship order in Table 5 correlated 0.47 and 0.43 with WOS and GS overall citations, respectively. This is likely due to the tradition some research teams have wherein papers with many authors reserve the last/seventh author spot for the senior research member of the team.

Interestingly, the data in Tables 4 and 5 conform nicely to a bibliometric phenomenon termed "Lotka's Law" (see, e.g., Lotka, 1926). In many performance domains, including academic publishing, systematic and predictable output differences exist across people. For example, Table 4 shows that obviously not all authors contribute equal numbers of papers. Instead, the distribution is skewed in a way predicted by Lotka's law. It predicts that the number of authors publishing n articles will be approximately $1/n^2$ of those publishing exactly one article (Lotka, 1926; for tests of the law's validity, see, e.g., Nicholls, 1989; Pao, 1986).

Fig. 2 shows actual and predicted frequencies for the number of authors who published x number of articles in the set. Visually, the data conform to Lotka's law. I verified this statistically by conducting a Kolmogorov-Smirnov test on the Fig. 2 data. It assesses whether two distributions are equal. The value for this test, $D = 0.894$, was not significant ($p = 0.40$). Thus, the actual and predicted author counts have statistically the same distributions. In sum, although many authors published a few articles here, few authors published many. This is shown in Fig. 2, and was predicted by Lotka's law.

Table 3
The fifteen (plus ties), most-cited articles in the set overall, and then per year, from both the Web of Science (WOS) and Google Scholar (GS).

First author/year	Title	WOS (GS) overall/WOS (GS) rank		WOS (GS) per year/WOS (GS) rank	
		WOS (GS)	WOS (GS)	WOS (GS)	WOS (GS)
McGrew (2009)	CHC theory and the human cognitive abilities project: Standing on the shoulders of the giants of psychometric intelligence research	281 (659)	1 (1)	31.8 (74.6)	1 (1)
Jaeggi (2010)	The relationship between n-back performance and matrix reasoning—implications for training and transfer	166 (299)	2 (2)	21.2 (38.2)	3 (3)
Nusbaum (2011)	Are intelligence and creativity really so different?: Fluid intelligence, executive processes, and strategy use in divergent thinking	150 (253)	3 (5)	22.0 (37.0)	2 (4)
Colom (2008)	Working memory and intelligence are highly-related constructs, but why?	146 (262)	4 (4)	14.9 (26.7)	7 (8)
Shamosh (2008)	Delay discounting and Intelligence: A meta-analysis	133 (280)	3 (3)	13.5 (28.5)	8 (7)
Johnson (2008)	Still just one g: Consistent results from five test batteries	104 (169)	6 (9)	10.6 (17.2)	12 (15)
Oberauer (2008)	Which working memory functions predict intelligence?	103 (171)	7 (8)	10.5 (17.4)	13 (14)
Salthouse (2011)	What cognitive abilities are involved in trail-making performance?	86 (147)	8 (13)	12.6 (21.5)	10 (11)
Salthouse (2008)	Contextual analysis of fluid intelligence	85 (132)	9 (–)	8.7 (13.4)	– (–)
Jauk (2013)	The relationship between intelligence and creativity: New support for the threshold hypothesis by means of empirical breakpoint detection	83 (167)	10 (10)	17.2 (34.6)	4 (5)
Colom (2009)	Gray matter correlates of fluid, crystallized, and spatial intelligence: Testing the P-FIT model	81 (142)	11 (14.5)	9.2 (16.1)	15 (–)
Lynn (2010)	National IQ calculated for 108 nations	80 (142)	12 (14.5)	10.2 (18.4)	14 (13)
Teasdale (2008)	Secular declines in cognitive test scores: A reversal of the Flynn Effect	79 (154)	13 (12)	8.0 (15.7)	– (–)
Chooi (2012)	Working memory training does not improve intelligence in healthy young adults	78 (131)	14 (–)	13.4 (22.5)	9 (10)
Karama (2009)	Positive associations between cognitive ability and cortical thickness in a representative U.S. sample of healthy 6 to 18 year-olds	75 (124)	15.5 (–)	8.5 (14.0)	– (–)
Koenig (2008)	ACT and general cognitive ability	75 (163)	15.5 (11)	7.6 (16.6)	– (–)
Wustenberg (2012)	Complex problem solving: More than reasoning?	66 (140)	– (–)	11.3 (24.0)	11 (9)
Hambrick (2014)	Deliberate practice: Is that all it takes to become an expert?	64 (209)	– (6)	16.7 (54.6)	5 (2)
Benedek (2014)	Intelligence, creativity, and cognitive control: The common and differential involvement of executive functions in intelligence and creativity	63 (119)	– (–)	16.5 (31.1)	6 (6)
Lynn (2009)	Average intelligence predicts atheism rates across 137 nations	58 (176)	– (7)	6.6 (19.9)	– (12)

Note. Citation values are as of October 31, 2017.

Table 4
Publication counts by (N = 1067) unique authors in the article set.

Number of publications	Frequency	Percent of authors	Cumulative percent
1	747	70.0	70.0
2	165	15.5	85.5
3	59	5.5	91.0
4	41	3.8	94.8
5	22	2.1	96.9
6	6	0.6	97.5
7	9	0.8	98.3
8	4	0.4	98.7
9	3	0.3	99.0
10	2	0.1	99.1
12	2	0.2	99.3
14	1	0.1	99.4
19	3	0.3	99.7
20	1	0.1	99.8
33	1	0.1	99.9
43	1	0.1	100

Note. Citation values are as of October 31, 2017.

Table 5
Publication count, overall Web of Science (WOS) and Google Scholar (GS) citations, and mean authorship order for the 18 most-frequently published authors in the set.

Author	Publication count	Overall WOS *M* (rank)	Overall GS *M* (rank)	Authorship order *M*
Ian Deary	43	17.5 (9)	30.9 (9)	3.7
Richard Lynn	33	18.5 (8)	36.3 (7)	1.7
Wendy Johnson	20	21.9 (6)	35.3 (8)	1.8
Roberto Colom	19	29.8 (1)	52.8 (1)	3.0
Jan te Nijenhuis	19	17.2 (10)	27.1 (11)	1.7
Michael Woodley	19	14.5 (12)	24.3 (14)	1.5
Heiner Rindermann	14	20.6 (7)	36.6 (6)	1.3
G. David Batty	12	25.7 (3)	45.3 (4)	3.4
Charlie Reeve	12	11.2 (16)	19.6 (16)	1.2
Richard Haier	10	29.3 (2)	50.3 (2)	2.7
Markus Sommer	10	14.2 (13)	24.5 (13)	2.4
Catharine Gale	9	25.1 (5)	47.6 (3)	2.7
Robert Plomin	9	15.4 (11)	29.1 (10)	3.6
Martin Arendasy	9	13.0 (14)	23.7 (15)	1.6
Timothy Salthouse	8	25.4 (4)	41.3 (5)	1.00
Andreas Demetriou	8	12.0 (15)	25.3 (12)	1.25
Bryan Pesta	8	10.9 (17)	19.3 (17)	1.25
Kevin Beaver	8	8.1 (18)	15.3 (18)	1.38

Notes. Citation values are as of October 31, 2017.

3.3. Additional/miscellaneous analyses

Turning things around, Table 6 shows the top 10 other journals with the most citations (in 2016) to papers published in *Intelligence* between the years 1977 and 2016. Unfortunately, WOS generates these reports only for the most recent year where complete data exist (here, 2016). The table is also somewhat non intuitive. First, note that papers in *Intelligence* were cited 4191 times in 2016, by 855 different journals. The top 10 list in Table 6, however, represents 871 of these 4191 (20.8%) citations. Therefore, just over one in five citations to *Intelligence* (in the year 2016) were from the journals in Table 6. Frequent readers of *Intelligence* will note many "usual suspects" in the table's journal list. It is also interesting that *Learning and Individual Differences*, and *Personality and Individual Differences* sum to just under 10% of all citations made in 2016 to papers published in *Intelligence*.

Next, a reviewer wondered whether citation counts differ across reviews/meta-analyses and regular research articles. Using WOS, I identified 37 articles that were either generic review articles or meta-analyses. These produced mean (median) overall WOS counts of 25.2

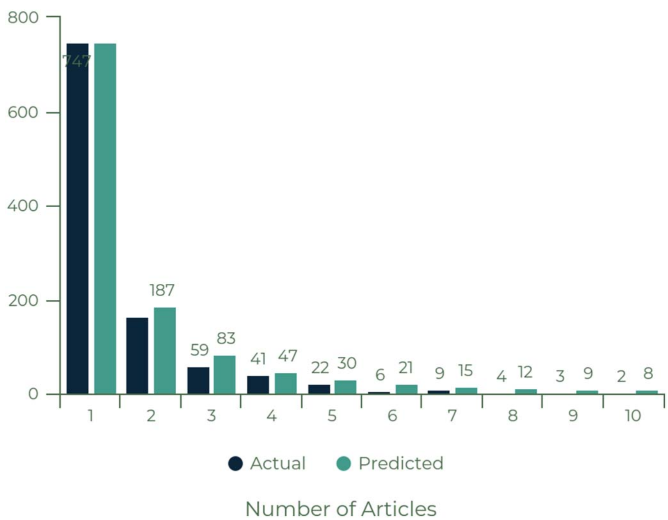

Fig. 2. Actual versus Predicted (by Lotka's Law) Number of Publications by Unique Authors.

Table 6
Journal Citation Reports' top 10 journals with the most citations (in 2016) of papers published in *Intelligence* between the years 1977 and 2016.

Rank	Journal title	*N* citations to *Intelligence* articles	*% total* citations to *Intelligence* articles
(–)	(*Intelligence*)	(654)	(15.6)
1	*Learning and Individual Differences*	215	5.13
2	*Personality and Individual Differences*	179	4.27
3	*Psychological Inquiry*	94	2.24
4	*Frontiers in Psychology*	92	2.20
5	*Spanish Journal of Psychology*	71	1.69
6	*PLOS One*	54	1.29
7	*NeuroImage*	53	1.26
8	*Journal of Experimental Psychology: General*	41	0.99
9.5	*Frontiers in Human Neuroscience*	36	0.86
9.5	*Psychological Assessment*	36	0.86

Notes. The total number of citations in 2016 to all *Intelligence* articles was 4191, coming from 845 different journals. However, 457 of these 855 journals (54.1%) in 2016 had cited only one article in *Intelligence* across 1977–2016. The remaining 388 journals in 2016 had 3734 citations to *Intelligence* (hence, 457 + 3734 = 4191 total citations in 2016). Finally, the top 10 journals listed here had 871 of these 4191 citations (20.8%).

(17). The 582 non-review papers produced mean (median) counts of 16.5 (10). A Mann-Whitney U test showed this difference to be significant ($Z = 3.03$). I also analyzed whether counts differ for open-access ($n = 26$) versus regularly published articles ($n = 593$). In this case, the mean (median) was 19.7 (12.5) for open access articles, and 16.9 (10) for “closed-access” articles. This difference was not significant ($Z = 0.98$), perhaps partly due to the small sample size for open access articles.

3.4. Updating the “all time” list

Finally, Table 7 is an update of Wicherts' (2009) top 25 list. His list included all articles published in this journal between 1977 and 2007. Table 7 thus represents the top 25 most WOS-cited articles in *Intelligence* from its inception through October 31, 2017. It is striking how relatively large the citation counts have become since Wicherts' (2009) analysis. His top 25 articles ranged from 81 to 492 citations overall. The new values range from 186 to 905. For perspective, the 25th most-cited article in the 2015 list (186 citations) would have ranked tied for sixth in the 2007 (i.e., Wicherts') list.

Also noteworthy is that nine of the articles in the old list (not shown here) dropped off the new list. Of their replacements, only three of the nine were published within the last decade: Deary, Strand, Smith, and Fernandes (2007); McGrew (2009), and Strenze (2007). The McGrew (2009) paper is again notable. It is the only article in my newer set (2008–2015) to make the all-time list. The paper ranks ninth on the all-time list with 281 citations, just eight years after being published.

Conversely, some of the articles on the old list amassed impressive citation counts since Wicherts (2009) first ranked them. For example, the Mayer, Caruso, and Salovey (1999) article acquired 568 additional citations over the course of just eight years.[4] Likewise, the Kyllonen and Christal (1990) paper received 413 more citations over this same timeframe. Of the 16, Wicherts-list articles surviving to the new list, the average increase in citation counts over eight years was 180.4 ($SD = 146.0$). Clearly, (a) these values increased substantially over time, and (b) they are impressive.

4. Discussion

I conducted bibliometric analyses for this journal on 619 articles published between 2008 and 2015. The aim was to update Wicherts (2009), thereby reporting which articles are having relatively-current impact on the field. Regarding articles, the journal produced comparatively large overall and per-year citation rates, but which had not changed much since Wicherts' analysis. Nonetheless, combined with Wicherts' (2009) data, and compared with other journals in the same category (i.e., psychology, multidisciplinary), the journal, *Intelligence*, fares well.

A table listing the top 15 most-cited papers (published since 2008) was also provided. It showed publications across a range of topics, with “working memory” appearing to be the most common. I also presented data on authorship; specifically, the number of authors, unique authors, and authors who had published multiple articles in the set. A table was included showing the top eighteen most frequently published authors (in the 2008–2015 set), together with their citations means. I then presented a few miscellaneous analyses, and thereafter updated the top 25 all-time list for articles published in *Intelligence*, from its inception through October 31, 2017.

On balance, the present article set nicely replicates the values Wicherts (2009) reported. Wicherts used his numbers as evidence of the considerably high impact of this journal. The replication of his study here—but with newer articles—seems to reinforce the conclusions Wicherts reached about *Intelligence*'s relatively-high impact.

A final issue is whether Google Scholar overestimates citations, although conversely, the Web of Science may instead underestimate them (Harzing, 2017). Consistent with past bibliometric research (Amara & Landry, 2012; Franceschet, 2010), although the GS/WOS differences are large here, they are of magnitude versus of rank. That is, GS produces counts here that are about twice as large as those WOS reports. Nonetheless, these counts correlate 0.97 across the two data sources. The matter may just reduce to whether one thinks citations from dissertations and book chapters, etc., should be included in citation counts (Google Scholar) or should not (Web of Science).

In conclusion, analyses of articles from this set indicate that *Intelligence* is a relatively high-impact journal. Many of its authors contribute more than one article to this journal, and some of its authors have written papers that are substantially impactful. Nine years later, I agree with Wicherts (2009), who said that “*Intelligence* has clearly met the goal of furthering our understanding of intelligence (p. 445).”

[4] Wicherts (2009) gathered his citation data on June, 23, 2009.

Table 7
The Web of Science top 25 most cited articles in *Intelligence* now (1977–2017), and then (1977–2007).

Rank now	First author/year	Title	Citations overall	Citations per year	Wicherts' (2009) rank	Δ Citations from 2007
1	Kyllonen (1990)	Reasoning ability is (little more than) working-memory capacity?!	905	32.3	1	413
2	Mayer (1999)	Emotional intelligence meets traditional standards for an intelligence	789	41.5	3	568
3	Deary (2007)	Intelligence and educational achievement	510	46.4	–	–
4	Gottfredson (1997a, b)	Why g matters: The complexity of everyday life	464	22.1	5	275
5	Conway et al. (2002)	A latent variable analysis of working memory capacity, short-term memory capacity, processing speed, and general fluid intelligence	449	28.1	11	315
6	Haier et al. (1988)	Cortical glucose metabolic-rate correlates of abstract reasoning and attention studied with positron emission tomography	345	11.5	4	147
7	Gustafsson (1984)	A unifying model for the structure of intellectual abilities	338	9.94	2	114
8	Mayer and Salovey (1993)	The intelligence of emotional intelligence	333	13.3	10	198
9	McGrew (2009)	CHC theory and the human cognitive abilities project: Standing on the shoulders of the giants of psychometric intelligence research	281	31.2	–	–
10	Deary et al. (2000)	The stability of individual differences in mental ability from childhood to old age: Follow-up of the 1932 Scottish Mental Survey	264	14.7	17	155
11	Ackerman (1996)	A theory of adult intellectual development: Process, personality, interests, and knowledge	258	11.7	21	170
12	Vernon (1983)	Speed of information processing and general intelligence	233	6.66	6	47
13	Hegarty (2002)	Development of a self-report measure of environmental spatial ability	232	14.5	–	–
14	Strenze (2007)	Intelligence and socioeconomic success: A meta-analysis of longitudinal research	226	20.6	–	–
16	Hegarty et al. (2006)	Spatial abilities at different scales: Individual differences in aptitude-test performance and spatial-layout learning	219	18.3	–	–
16	Süß et al. (2002)	Working-memory capacity explains reasoning ability—and a little bit more	219	13.7	20	131
16	Gottfredson (1997a, b)	Mainstream science on intelligence: An editorial with 52 signatories, history, and bibliography	219	10.4	–	–
18	Oberauer et al. (2003)	The multiple faces of working memory: Storage, processing, supervision, and coordination	215	14.3	–	–
19.5	McDaniel (2005)	Big-brained people are smarter: A meta-analysis of the relationship between in vivo brain volume and intelligence	200	15.4	–	–
19.5	Haier et al. (1992)	Intelligence and changes in regional cerebral glucose metabolic rate following learning	200	7.69	13	84
21	Colom (2004)	Working memory is (almost) perfectly predicted by g	199	14.21	–	–
22	Willerman et al. (1991)	In vivo brain size and intelligence	198	7.33	8	40
23	Detterman and Daniel (1989)	Correlations of mental tests with each other and with cognitive variables are highest for low IQ groups	190	6.55	14	75
24	Marshalek et al. (1983)	The complexity continuum in the radix and hierarchal models of intelligence	189	5.40	15	79
25	Jensen and Weng (1994)	What is a good g?	186	7.75	16	76

Note. Citation scores according to official count in ISI Web of Science as of October 31, 2017.

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