Citation rates for experimental psychology articles published between 1950 and 2004: Top-cited articles in behavioral cognitive psychology

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Abstract From citation rates for over 85,000 articles published between 1950 and 2004 in 56 psychology journals, we identified a total of 500 behavioral cognitive psychology articles that ranked in the top 0.6 % in each half-decade, in terms of their mean citations per year using the *Web of Science*. Thirty nine of these articles were produced by 78 authors who authored three or more of them, and more than half were published by only five journals. The mean number of cites per year and the total number of citations necessary for an article to achieve various percentile rankings are reported for each journal. The mean number of citations necessary for an article published within each half-decade to rank at any given percentile has steadily increased from 1950 to 2004. Of the articles that we surveyed, 11 % had zero total citations, and 35 % received fewer than four total citations. Citations for post-1994 articles ranking in the 50th–75th and 90th–95th percentiles have generally continued to grow across each of their 3-year postpublication bins. For pre-1995 articles ranking in the 50th–75th and 90th–95th percentiles, citations peaked in the 4- to 6- or 7- to 9-year postpublication bins and decreased linearly thereafter, until asymptoting. In contrast, for the top-500 articles, (a) for pre-1980 articles, citations grew and peaked 10–18-year postpublication bins, and after a slight decrease

began to linearly increase again; (b) for post-1979 articles, citations have continually increased across years in a nearly linear fashion. We also report changes in topics covered by the top-cited articles over the decades.

Keywords Citations · Cognitive psychology · Impact factor

Introduction

The number of citations that academic articles receive has become a well-accepted, objective measure for evaluating the impact (and likely the quality) of journals (Garfield, 1972), researchers, departments, programs, or institutions (Nosek et al., 2010; Rushton, 1984). A very high citation rate for a published article indicates that the research it reports has had a major impact in guiding the research reported in other articles in that field. Hence, an academic institution or research unit that has published many highly cited articles is thought to provide an environment in which important, high-impact research can be conducted, making that institution a more desirable location for other scientists or prospective students looking to advance their careers. For a journal, highly cited articles directly affect the journal's impact factor, which can influence journal submissions, because researchers strive to publish their articles in the most prestigious, and hence widely read, journals. As for individual researchers, total citation counts are correlated with eminence in one's field, as measured by their ability to predict future Nobel laureates (Garfield & Welljams-Dorof, 1992) and attainment of other scientific awards (Myers, 1970). Moreover, the citation rate for each of an individual researcher's articles is a key component in determining that researcher's Hirsch index (h-index), which is the

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number of that researcher's published articles that have received at least h citations each (Hirsch, 2005). (For example, an h -index of 5 indicates that the researcher has five articles, each of which has accrued at least five citations.) Despite the limitations of the h -index (see Krampen, Becker, Wahner, & Montada, 2007), at academic institutions emphasizing research, it is currently one of the most widely used measures (along with grant dollars received) for determining whether a candidate should be hired, tenured, or promoted, because it is a composite measure of both quantitative research output (i.e., the number of articles one has produced) and the impact that those articles have had on guiding the research of others.

Another way that citations can be used is to determine which individual publications have had a major impact on guiding the research of others in that research area. For cognitive psychology, White (1983) identified 50 prominent publications (journal articles and books) indexed in the 1979–1982 volumes of the *Social Sciences Citation Index* (SSCI) that (a) had averaged more than 20 citations per year in the 1971–1982 SSCI and (b) had at least five citations per year in any one of the eight major journals he surveyed. Although White provided a reasonably good reference for prominent cognitive psychology publications at that time, it was necessarily quite limited in its scope, due to citation counts not yet being available in electronic databases. In a follow-up to White's study, Standing (2009) examined citation trends across the years for 26 of the 50 publications that White identified. Standing found that citations increased for the first 5 years after an article's publication, but then monotonically declined, a trend that he noted was also evident in the physical sciences (de Solla Price, 1986). However, one should be cautious in accepting Standing's conclusion. Because his small sample size included both textbooks and journal articles, it may be that the inverted-U trend holds true only for textbooks or only for journal articles. Also, he counted citations only from 1971–1993, and as we show here (see Table 1 below), 14 journals that publish a large number of articles on cognitive psychology started in 1990 or later. The greater opportunity for citations in these new journals could have offset the downturn that Standing reported.

Using an electronic database that allows for a much more thorough and comprehensive analysis of a much larger sample of articles and journals, the present study updates and extends the work of White (1983) and Standing (2009). We focused on journals that mostly publish articles relevant to behavioral measures of cognition in brain-intact humans older than 5 years of age and with no diagnosis of a psychological disorder. (For brevity's sake, we will hereafter use the shorthand term “cognitive” articles in referring to articles that meet these criteria.) In particular, our goals were to identify (1) the mean number of cites per year that such

articles receive;¹ (2) the mean and total number of citations such articles need in order to achieve various percentile rankings relative to all surveyed published articles² in (a) all years or (b) the same half-decade; (3) the citation trends across 3-year postpublication bins; and (4) 500 (an arbitrarily chosen number) very highly cited “cognitive” articles that were published between 1950 and 2004. We then did a more detailed analysis of these top-500 articles, including reporting (a) the journals in which they were published, (b) the distribution of the number of researchers who were authors on three or more top-500 articles, (c) how changes in citation patterns for the top-500 articles compare to those for lesser-cited articles, and (d) how the research areas represented by the top-500 articles have changed across the years.

Our top-500 list is based on mean citations per year rather than on total citations, so as not to give an unfair advantage to older articles that would have had additional years to accumulate citations. However, ranking an article on the basis of mean citations per year without taking its year of publication into account has its limitations. Because the number of journals (and of articles published) increased rather dramatically in the late 1960s (see Table 2 below) and has steadily increased since then, more recently published articles would have many more opportunities to be cited in the peak years closely following their publication and to have less time to drop off in later years (if the temporal trend reported by Standing, 2009, holds for our much larger sample). This would give more recent articles an unfair advantage in achieving higher mean citations per year, thereby resulting in their being overrepresented in our top-500 list. To address this concern, we used a year-of-publication cohort analysis that segregated articles into one of 11 five-year bins, with articles in the first bin having 1950–1954 publication dates, and the last bin having 2000–2004 publication dates. We stopped at 2004 so that all articles would have citations from at least two 3-year postpublication bins.

Method

Procedure

From the psychology and language categories of the 2008 volume of *Journal Citation Reports*, we selected as potential candidates for inclusion in our sample all journals that we

¹ Although one might question whether the median is a more suitable measure than the mean, we used the mean because it is much more closely tied to the number of total citations, which is used to compute both a researcher's h -index and a journal's impact factor. Nonetheless, for some of the analyses that we report, we consider both means and medians.

² Total citations can be informative because an article that has had a moderate number of citations over a long period of time can also be considered to have had a significant impact.

Table 1 Journals surveyed and mean citations per year needed to achieve various percentile rankings as a function of journal

Journal	Years Covered	No. of Articles (% of All Articles)	Mean Cites per Year	Mean Cites per Year Needed to Achieve the Given Percentile Ranking							Top-Cited “Cognitive” Article	No. of Top-500 “Cognitive” Articles (% Relative to Total Articles in Journal)
				25 %	50 %	75 %	85 %	90 %	95 %	99 %		
<i>Acta Psychologica (Acta Psych)</i>	1956–2004	2,208 (2.57)	0.76	0.04	0.23	0.73	1.31	1.80	3.00	8.78	38.78	3 (0.14)
<i>American Journal of Psychology (Amer J Psych)</i>	1950–1954, 1956–2004	2,410 (2.80)	0.42	0.06	0.19	0.48	0.75	0.98	1.56	3.40	7.57	3 (0.12)
<i>American Psychologist (Amer Psych)</i>	1956–2004	2,767 (3.22)	2.10	0.10	0.37	2.27	4.21	5.71	9.00	20.27	76.68*	15 (0.54)
<i>Annual Review of Psychology (Ann Rev Psych)</i>	1950, 1952–1968, 1970–2004	1,030 (1.20)	4.24	0.23	1.20	4.57	8.48	11.67	18.79	37.36	32.33*	13 (1.26)
<i>Applied Cognitive Psychology (App Cog Psych)</i>	1989–2004	681 (0.79)	1.20	0.33	0.80	1.57	2.25	2.71	3.67	6.71	12.36*	0 (0.00)
<i>Applied Psycholinguistics (App Psycholing)</i>	1980–2004	538 (0.63)	1.15	0.29	0.71	1.48	2.00	2.59	3.80	7.08	7.91*	0 (0.00)
<i>Behavioral and Brain Sciences^a (BBS)</i>	1978–2004	6,035 (7.02)	0.53	0.00	0.00	0.11	0.21	0.32	1.42	13.00 ^b	79.80	17 (0.28)
<i>British Journal of Psychology (Brit J Psych)</i>	1956–2004	2,019 (2.35)	0.96	0.13	0.40	1.08	1.69	2.33	3.53	8.25	43.91	5 (0.25)
<i>Canadian Journal of Experimental Psychology^c (Can J Exp Psych)</i>	1972–2004	950 (1.10)	0.99	0.14	0.44	1.14	1.72	2.44	3.77	7.88	17.29*	2 (0.21)
<i>Cognition (Cog)</i>	1972–2004	1,088 (1.27)	3.86	1.00	2.43	4.83	7.09	9.11	12.98	25.17	40.58*	16 (1.47)
<i>Cognition & Emotion (Cog & Emot)</i>	1990–2004	472 (0.55)	2.65	0.80	1.67	3.37	4.72	5.64	8.81	17.27	16.29*	1 (0.21)
<i>Cognition and Instruction (Cog & Instru)</i>	1988–2004	206 (0.24)	1.97	0.56	1.31	2.38	3.27	4.32	6.67	16.16	15.69*	0 (0.00)
<i>Cognitive Development (Cog Dev)</i>	1986–2004	379 (0.44)	1.67	0.58	1.09	2.00	3.08	3.89	5.10	11.49	15.00	0 (0.00)
<i>Cognitive Psychology (Cog Psych)</i>	1970–2004	640 (0.74)	4.90	1.43	3.03	5.77	8.07	10.71	16.17	32.47	106.66	38 (5.93)
<i>Cognitive Science (Cog Sci)</i>	1980–2004	458 (0.53)	3.42	0.80	1.90	3.81	5.66	7.62	10.22	27.41	81.68	5 (1.09)
<i>Consciousness and Cognition (Consc & Cog)</i>	1992–2004	194 (0.23)	1.92	0.47	1.19	2.45	3.49	4.45	7.02	11.35	12.20	0 (0.00)
<i>Current Directions in Psychological Science (Curr Dir Psych Sci)</i>	1994–2004	352 (0.41)	2.92	1.32	2.08	3.60	4.93	5.82	8.07	12.04	24.43	1 (0.28)
<i>Discourse Processes (Disc Process)</i>	1980–2004	545 (0.63)	0.99	0.23	0.54	1.13	1.71	2.25	3.18	6.91	38.82	1 (0.18)
<i>European Journal of Cognitive Psychology (EJCP)</i>	1992–2004	273 (0.32)	1.23	0.38	0.75	1.69	2.33	2.83	3.89	6.72	8.60	0 (0.00)
<i>Experimental Psychology^d (Exp Psych)</i>	1995–2004	260 (0.30)	0.97	0.13	0.40	1.00	1.50	1.98	4.10	12.20	19.33	0 (0.00)
<i>Intelligence (Int)</i>	1980–2004	652 (0.76)	1.38	0.33	0.72	1.61	2.43	3.12	4.39	11.18	24.68	2 (0.31)
<i>Journal of Child Language (J Child Lang)</i>	1976–2004	863 (1.00)	1.14	0.30	0.71	1.45	2.00	2.57	3.90	7.93	10.75	0 (0.00)
<i>Journal of Experimental Child Psychology (JEP:LMC)</i>	1964–2004	2,464 (2.87)	1.00	0.20	0.50	1.15	1.81	2.45	3.59	7.52	18.42	4 (0.16)
<i>Psychology (J Exp Child Psych)</i>	1950–1975	4,994 (5.81)	0.62	0.15	0.32	0.66	0.98	1.28	1.92	5.09	29.20	26 (0.52)
<i>Journal of Experimental Psychology (JEP)</i>	1975–2004	744 (0.87)	4.59	1.00	2.50	5.42	8.10	10.82	16.22	40.45	53.14	32 (4.30)
<i>Journal of Experimental Psychology: General (JEP:Gen)</i>	1975–2004	2,156 (2.51)	2.82	0.86	1.83	3.55	5.06	6.39	8.71	17.35	35.70	24 (1.11)
<i>Human Perception and Performance (JEP:HPP)</i>	1975–2004	2,109 (2.45)	2.90	0.76	1.90	3.76	5.44	6.62	8.71	16.16	63.23*	16 (0.76)
<i>Journal of Experimental Psychology: Learning Memory and Cognition^e (JEP:LMC)</i>	1975–2004	2,109 (2.45)	2.90	0.76	1.90	3.76	5.44	6.62	8.71	16.16	63.23*	16 (0.76)

Table 1 (continued)

Journal	Years Covered	No. of Articles (% of All Articles)	Mean Cites per Year	Mean Cites per Year Needed to Achieve the Given Percentile Ranking					Top-Cited “Cognitive” Article	No. of Top-500 “Cognitive” Articles (% Relative to Total Articles in Journal)		
				25 %	50 %	75 %	85 %	90 %			95 %	99 %
<i>Journal of General Psychology</i> (J Gen Psych)	1956–2004	2,290 (2.66)	0.19	0.02	0.07	0.19	0.33	0.47	0.79	2.00	6.33*	0 (0.00)
<i>Journal of Memory and Language</i> ^f (JML)	1962–2004	2,716 (3.16)	2.02	0.27	0.86	2.47	3.74	4.89	7.28	15.95	87.08	38 (1.40)
<i>Journal of Psycholinguistic Research</i> (J Psych Res)	1972–2004	857 (1.00)	0.52	0.08	0.25	0.66	1.00	1.31	1.86	3.56	7.00*	0 (0.00)
<i>Language and Cognitive Processes</i> (Lang Cog Proc)	1990–2004	301 (0.35)	2.06	0.61	1.23	2.30	3.29	4.57	7.28	14.88	12.29*	0 (0.00)
<i>Language and Speech</i> (Lang & Spch)	1958–2004	1,044 (1.21)	0.44	0.06	0.21	0.54	0.83	1.13	1.57	3.32	12.83	0 (0.00)
<i>Learning and Instruction</i> (Lang & Instr)	1997–2004	195 (0.23)	1.56	0.40	0.90	2.00	2.71	3.90	6.10	9.84	10.17	0 (0.00)
<i>Memory</i> (Mem)	1994–2004	346 (0.40)	1.82	0.60	1.33	2.46	3.17	3.84	5.23	10.38	14.31	0 (0.00)
<i>Memory & Cognition</i> (Mem & Cog)	1974–2004	2,478 (2.88)	1.68	0.43	1.05	2.20	3.04	3.85	5.33	10.61	22.00	7 (0.28)
<i>Merrill-Palmer Quarterly: Journal of Developmental Psychology</i> (MPQ-JDP)	1966–2004	900 (1.05)	1.03	0.20	0.52	1.23	1.88	2.42	3.50	7.74	13.09*	0 (0.00)
<i>Mind & Language</i> (Mind & Lang)	1994–2004	217 (0.25)	0.94	0.14	0.40	1.04	2.00	2.61	3.64	7.73	8.00*	0 (0.00)
<i>Music Perception</i> (Mus Perc)	1983–2004	403 (0.47)	0.98	0.35	0.70	1.26	1.67	2.11	2.91	5.35	7.71	0 (0.00)
<i>Perception</i> (Perc)	1973–2004	2,426 (2.82)	1.02	0.20	0.56	1.29	1.88	2.44	3.50	6.89	16.60	3 (0.12)
<i>Perception & Psychophysics</i> (Perc & Psychophys)	1966–2004	4,714 (5.48)	1.19	0.21	0.64	1.43	2.14	2.77	4.17	8.89	33.25	16 (0.33)
<i>Perceptual and Motor Skills</i> (Perc Mot Skills)	1960–2004	14,717 (17.11)	0.25	0.03	0.12	0.32	0.48	0.63	0.92	1.96	15.03*	1 (0.01)
<i>Psychological Bulletin</i> (Psych Bul)	1950–2004	3,079 (3.58)	4.78	0.52	1.58	4.77	8.44	11.60	19.00	45.82	79.75*	31 (1.01)
<i>Psychological Inquiry</i> (Psych Inq)	1994–2004	193 (0.22)	1.66	0.08	0.31	0.92	2.66	4.28	8.90	18.63	12.29*	0 (0.00)
<i>Psychological Research</i> ^g (Psych Res)	1950–1955, 1957–1959, 1966–1968, 1974–2004	976 (1.13)	0.90	0.11	0.39	1.00	1.67	2.27	3.91	7.52	16.22	1 (0.10)
<i>Psychological Review</i> (Psych Rev)	1950–2004	1,699 (1.98)	5.64	0.47	1.91	6.00	10.05	14.57	23.06	60.65	94.28*	134 (7.89)
<i>Psychological Science</i> (Psych Sci)	1990–2004	1,084 (1.26)	3.95	1.40	2.81	5.40	7.00	8.64	11.85	19.01	44.33	5 (0.46)
<i>Psychology and Aging</i> (Psych & Aging)	1987–2004	1,004 (1.17)	2.91	1.21	2.16	3.64	5.05	6.07	8.13	14.86	20.43	3 (0.30)
<i>Psychology of Learning and Motivation</i> (Psych Learn & Motiv)	1983–1987, 1991–1994, 1996, 2000–2004	153 (0.18)	1.60	0.36	0.96	2.03	2.80	3.29	5.84	11.00	11.00	0 (0.00)
<i>Psychonomic Bulletin & Review</i> (PB&R)	1994–2004	743 (0.86)	2.75	0.80	1.63	3.21	4.65	6.00	8.77	17.99	60.27	8 (1.08)
<i>Quarterly Journal of Experimental Psychology</i> ^h (QJEP)	1950–2004	2,172 (2.53)	1.37	0.21	0.60	1.57	2.46	3.31	5.00	11.72	80.48	13 (0.60)
<i>Reading Research Quarterly</i> (Read Res Quart)	1965–1974, 1976–2004	808 (0.94)	1.31	0.18	0.67	1.60	2.33	3.00	4.20	10.67	45.30	2 (0.25)
<i>Scandinavian Journal of Psychology</i> (Scan J Psych)	1960–2004	1,677 (1.95)	0.48	0.07	0.21	0.55	0.89	1.17	1.80	4.15	10.97*	0 (0.00)
<i>Social Cognition</i> (Soc Cog)	1983–2004	389 (0.45)	1.63	0.55	1.11	1.87	2.92	3.57	5.21	12.00	15.25*	1 (0.26)
<i>Spatial Vision</i> (Spat Vis)	1993–2004	204 (0.24)	1.88	0.25	0.60	1.54	1.96	2.78	4.45	75.55 ^c	10.00*	0 (0.00)
<i>Trends in Cognitive Sciences</i> (Trends Cog Sci)	1997–2004	457 (0.53)	6.97	1.50	3.88	8.81	12.50	17.10	21.21	53.56	60.67*	11 (2.41)
<i>Visual Cognition</i> (Vis Cog)	1996–2004	266 (0.31)	2.12	1.29	1.33	2.57	3.80	4.94	6.71	15.45	19.44	2 (0.75)

Table 1 (continued)

Journal	Years Covered	No. of Articles (% of All Articles)	Mean Cites per Year	Mean Cites per Year Needed to Achieve the Given Percentile Ranking						Top-Cited “Cognitive” Article	No. of Top-500 “Cognitive” Articles (% Relative to Total Articles in Journal)
				25 %	50 %	75 %	85 %	90 %	95 %	99 %	
Total	56	85,995									
		Median cites	–	0.10	0.38	1.31	2.24	2.98	4.75	11.74	
		Mean cites	1.48	0.10	0.40	1.40	2.50	3.57	6.00	15.80	
		Total cites	28.27	2.00	9.00	26.00	44.00	63.00	108.00	288.00	

* The top-cited article in this journal was not a “cognitive” article.

^a The curiously low mean cites per year needed to achieve the 25th, 50th, and 75th percentiles are due to this journal publishing many commentaries, which are rarely cited, to a target article. Because WoS identifies commentaries as articles, these were included in our database as “articles.”

^b Mean cites per year increased sharply from the 95th to the 99th percentile, due to relatively few articles obtaining considerable citations per year.

^c Formerly known as the *Revue Canadienne de Psychologie Experimentale*.

^d Formerly known as the *Zeitschrift für Experimentelle Psychologie*.

^e Formerly known as the *Journal of Experimental Psychology: Human Learning and Memory*.

^f Formerly known as the *Journal of Verbal Learning and Verbal Behavior*.

^g Formerly known as *Psychologische Forschung*. ^h Formerly known as the *Quarterly Journal of Experimental Psychology—Section A*.

believed publish a substantial number of peer-reviewed “cognitive” articles. Because it would not be feasible to sort through thousands of articles to determine whether each article met our criteria for being included in our top-500 list, we excluded journals (e.g., *International Journal of Psychology*) for which fewer than 40 % (an arbitrary number selected by the present authors) of their total articles are “cognitive” articles. (For journals that we were uncertain met the 40 % criteria, we reviewed the content of all of the articles published in two or three randomly selected issues that were published at least 3 years apart.) We also excluded journals that primarily publish articles that (a) employ neuroimaging or electrophysiology techniques to obtain their data (e.g., *Journal of Cognitive Neuroscience*), (b) are not written in English (e.g., *Psicologica*), or (c) were not subject to even nominal peer review (e.g., *Bulletin of the Psychonomic Society*). Two journals, *Journal of Research in Reading and Thinking & Reasoning*, that met the above criteria were nonetheless excluded because the electronic version of the *Web of Science* (WoS) that we had available only included 2 years of data from each of these journals. Although fewer than 40 % of the articles published in some journals that publish review articles on psychological research (e.g., *Psychological Bulletin* and *Annual Review of Psychology*) are “cognitive” articles, these journals were included because many of the integrative reviews they publish have had a significant impact in the field of cognitive psychology. The 56 journals making our final list are provided in Table 1. (As indicated there, the data from renamed journals were combined—e.g., the data for the *Journal of Verbal Learning and Verbal Behavior* were combined with the data for the *Journal of Memory and Language*.)

We used the electronic 4.10 version of WoS, which includes the *Science Citation Index* and SSCI, to search for articles and calculate the number of citations that they received in each year since their publication. WoS is a tool well regarded by researchers, particularly social scientists, because of its comprehensiveness. As of 2011, the database consisted of 2,474 social sciences journals across 50 disciplines (Thomson Reuters, n.d.–c). The citations for each article are from all journals and book chapters indexed by WoS, though citations coming from chapters are infrequent, because the data from chapters are very limited. Although the *Scopus* and *Google Scholar* databases also provide citation counts for an article, they are less well suited to our study than is WoS. *Scopus* includes references only back to 1996, and *Google Scholar* does not separate by year the number of citations that an article has received, making the task of obtaining the data necessary for evaluating the changes in citation rates over years extremely difficult to extract. (However, it should also be noted that *Google Scholar* is more comprehensive than WoS, in that it includes more publications, especially books and chapters, as well as

Table 2 Mean citations per year needed to achieve various percentile rankings as a function of year of publication

Year of Publication	Number of Articles	Number of Top-500 “Cognitive” Articles	Mean Cites per Year	Mean Cites per Year Needed to Achieve the Given Percentile Ranking							Range of Mean Cites per Year for Top-Cited “Cognitive” Articles
				25 %	50 %	75 %	85 %	90 %	95 %	99 %	
1950–54	1,500	9	0.58	0.07	0.22	0.52	0.81	1.14	2.03	7.34	7.98–29.20*
1955–59	2,403	14	0.70	0.06	0.20	0.54	0.90	1.32	2.35	7.55	6.96–92.36*
1960–64	4,081	24	0.53	0.04	0.18	0.52	0.87	1.23	2.02	5.51	5.04–18.76*
1965–69	7,486	43	0.54	0.05	0.18	0.48	0.78	1.13	1.88	5.70	5.73–38.78*
1970–74	8,870	52	0.70	0.06	0.22	0.60	1.05	1.50	2.70	7.71	7.23–87.08
1975–79	9,156	53	0.94	0.03	0.22	0.73	1.33	2.00	3.67	9.56	9.90–94.28*
1980–84	9,419	55	1.25	0.07	0.29	1.07	1.96	2.92	5.03	15.00	13.83–106.66*
1985–89	9,538	55	1.62	0.09	0.41	1.46	2.65	3.83	6.45	18.16	16.95–75.91*
1990–94	10,550	61	1.97	0.16	0.65	2.00	3.43	5.00	8.02	17.16	15.27–81.68*
1995–99	11,196	65	2.26	0.30	0.93	2.50	3.92	5.40	8.45	19.09	16.00–79.80*
2000–04	11,796	69	2.60	0.44	1.29	3.00	4.43	5.86	9.13	21.56	14.83–72.75*
Total	85,995	500	1.48	0.10	0.40	1.40	2.50	3.57	6.00	15.80	
			Median	0.00	0.27	1.14	2.09	3.25	5.36	14.22	

* The citation rate provided here for the highest cited cognitive article in the designated half decade was exceeded by the citation rate(s) of one or more noncognitive articles that were published during that same half decade by the journals listed in Table 1.

citations from nonacademic sources such as newspapers and websites.)

Separate searches were conducted for each of the journals to find all articles (not just “cognitive” articles) published in that journal between 1950 and 2004. For some journals, WoS did not have a complete record of all of their issues. (We address this gap in the [Discussion](#) section.) In our WoS search, each journal search was refined by restricting the results to “Articles” and “Review” using the “Document Types” filter. The “Create Citation Report” feature was used to obtain the total number of citations each article received in each year from its publication through 2008, and the data were then exported, the maximum-permitted 500 articles at a time, into Microsoft Excel for further processing. Because this search resulted in a rather large number of duplicate entries in the database, the “Remove Duplicates” feature provided in Microsoft Excel was used. An entry was classified as a duplicate if another article had the same (a) title and (b) author(s) and was published in the same (c) journal and (d) year.

Results

Table 1 shows the exact years for which we were able to retrieve data for each of the 56 journals from WoS. As is shown there, our database contained a total of 85,995 articles before we culled the top-cited articles to identify

those that met our criteria for inclusion as a “cognitive” article. Table 1 also shows the mean numbers of citations per year³ that an article (noncognitive as well as “cognitive”)⁴ would need in order to achieve a percentile ranking of 25, 50, 75, 85, 90, 95, or 99 in each journal. (It is important to note that the citation counts come from all journals covered by WoS, not just the 56 journals shown in Table 1.) The penultimate column gives the number of citations received per year by the most highly cited “cognitive” article in each journal across all of its covered years of publication. (For some of the journals, the most highly cited article was not a “cognitive” article.) The last three rows of Table 1 give the percentile data in median and mean cites per year and total cites, respectively, when the data across all journals are considered as having come from a single source.

As is shown in Table 1, the number of cites per year that an article receives is highly variable across journals. An article published in *Trends in Cognitive Sciences* received an average of 6.79 citations per year, whereas an article published in *Journal of General Psychology* received an

³ The year in which the article was published was always counted as a full year in the computation of mean cites per year.

⁴ We computed the percentile rankings for all articles rather than for only cognitive psychology articles because it would be impractical to examine over 85,000 articles so as to cull out all articles that did not meet our criteria for inclusion as a “cognitive” article.

average of only 0.19 citations per year. An article only needed to average less than half a citation per year to achieve a percentile ranking of 50 % across all journals. This finding is consistent with Harzing's (2010) conclusion that "The average article in the social sciences and humanities is cited less than once a year" (p. 6). (The Harzing data are based on citation counts from *Google Scholar* rather than WoS.) The variability across journals in the mean cites per year that an article would need to achieve a percentile ranking of 50 % within each journal is much less than that needed to achieve the percentile ranking of 99 %. When the data are aggregated across all journals, the mean number of citations per year that an article would need to achieve a specific percentile ranking increases gradually up to the 95th percentile. However, in order for an article to achieve a percentile ranking of 99 %, it needs approximately ten more citations per year than (or almost thrice as many citations as) an article at the 95th percentile. In contrast, an article at the 90th percentile needs only two additional citations per year in order to achieve a percentile ranking of 95 %.⁵ This indicates an extreme positive skew in the frequency distribution of mean cites per year.

Examination of the total citation data reveals that 11 % of all surveyed articles received zero citations, and 35 % received four or fewer total citations. Thus, a large number of articles are rarely cited. As noted earlier, total citations influence the h-index, a commonly used measure of a researcher's productivity and impact. Our data also show the difficulty of achieving an h-index of 26, which means that one would need to have published 26 articles with 26 or more total citations, ranking them in the top 25 % of all of our surveyed articles.

To examine how mean citations per year have changed as a function of an article's publication date, we segregated all 85,995 articles into one of 11 five-year bins, with articles in the first bin having 1950–1954 publication dates, and the last bin having 2000–2004 publication dates. For each of these "era" bins, Table 2 displays the data corresponding to the data provided for each journal in Table 1. The mean number of citations per year as a function of era shows a clear, positive linear trend (with the mean citations per year of an article published in the 1950–1954 and 2000–2004 eras being 0.58 and 2.60, respectively). This is not surprising, as the numbers of journals and articles (second column of Table 2) have dramatically increased over the years,

thereby providing many additional opportunities for articles to be cited in more recent years. This supports the need to evaluate mean cites per year by eras. In Table 2's third column, the number of top-ranked articles to be included in each bin was adjusted for the number of total articles in that bin relative to the total number of articles across all years in the database. This adjustment was made to ensure that the bottom-ranked of the top-cited articles within all bins would have the same percentile rank within their respective bins. (The two values in the last column of Table 2 are the mean numbers of citations of the lowest- and highest-ranked top-500 "cognitive" articles in that bin.) For example, in the 1950–1954 bin there are 1,500 articles, representing 1.7 % of the 85,995 total articles in the database. Hence, the nine most-cited behavioral cognitive articles (1.7 % of 500) are reported for the 1950–1954 cohort, with these nine articles ranking in the top 0.6 % (i.e., $9/1,500$) for that cohort. For the 1970–1974 cohort, 52 articles are reported (i.e., $[8,870/85,995] \times 500$), with these 52 articles ranking in the top 0.6 % (i.e., $52/8,870$) for that cohort.

To obtain our final top-500 list, after sorting the articles within each era bin in descending order of mean citations per year, we started at the top and carefully examined each article and removed those that did not meet our inclusion criteria for "cognitive" articles.⁶ In addition, we excluded articles that published stimulus norms (e.g., Battig & Montague, 1969), tutorials for software (e.g., Pelli, 1997), general statistical articles (e.g., Clark, 1973; Ratcliff, 1979), or computer modeling articles (almost all of which were published in *Cognitive Science*) that focused on creating computer models and evaluating what they could do, but in which human performance was not considered or was mentioned only in passing (e.g., Gentner, 1983). The articles in each era bin were culled until we reached the number needed in that bin so as to obtain our top-500 list. The resulting 500 articles across all bins are reported in Appendix A. The data are presented in ascending order of era bins and in descending order within each bin, based on mean cites per year.

In our top-500 list, 27 of the 56 journals (48 %) had zero articles or only one article represented (see the last column of Table 1), representing only 1.2 % of the top-500 articles. In contrast, 54.6 % (273) of our top-500 articles were published in only five journals: *Psychological Review*, *Cognitive Psychology*, *Journal of Memory and Language* (which includes the *Journal of Verbal Learning and Verbal*

⁵ The majority of articles in some journals, such as *Spatial Vision* and *Behavioral and Brain Sciences*, are not cited often, but a few articles from those journals are highly cited, which leads to an immense increase in the mean citations per year needed to achieve the 99th percentile ranking. For *Behavioral and Brain Sciences*, this is due to the fact that it publishes a few integrative target articles (highly cited) and a large number of brief comments (with very low citation rates) on those target articles.

⁶ Our list includes one article in which the researchers tested a group of subjects with parietal lesions (Egley, Driver, & Rafal, 1994). This article was included because normals were also tested, creating a new paradigm that has been extensively used with normals to test general theories of visual attention, and because over 60 % of the articles that have cited it have themselves been "cognitive" articles.

Behavior), *Psychological Bulletin*, and *Journal of Experimental Psychology: General*. In terms of the absolute number of articles making our top 500, *Psychological Review* ranked number one, with 134 articles, representing 7.89 % of the total articles published in the journal between 1950 and 2004. Because this is 26.8 % of our top-500 list and is much, much higher than the 1.98 % of the total articles that it published within the database we created, this makes *Psychological Review* by far the most overrepresented journal in our top-500 list. The journal with the second highest percentage of its articles making our top-500 list was *Cognitive Psychology*, at 5.93 %, which is much higher than the

0.74 % of the total articles in our database that it published between 1970 (its first year of publication) and 2004. Clearly, the most highly cited articles are overrepresented in only a few journals.

The three rows of panels in Fig. 1 show the mean citations per year that articles published in a specific era received as a function of the number of years after their publication. Because articles with percentile ranks below 50 % showed a floor effect, Figs. 1a–b, c–d, and 1e–1f display the mean citations per year for articles having rankings in (a–b) the 50th–75th percentiles and (c–d) the 90th–95th percentiles of all articles (including noncognitive

Fig. 1 Mean citations per year following publication (a) for articles ranking in the 50th–75th percentiles of articles published between 1950 and 1979; (b) for articles in the same percentile range published between 1980 and 2004; (c) for articles ranking in the 90th–95th percentiles of articles published between 1950 and 1979; (d) for articles in the same percentile range published between 1980 and 2004; (e) for articles ranking

in the top-500 list published between 1950 and 1979; (f) for articles in the top-500 list published between 1980 and 2004. Because the *Web of Science* does not separate citation data by individual years for the years 1950–1954, the data points for the first 3 years postpublication for articles published in 1950 and 1951 are for 5 and 4 years, respectively

articles), as well as for (e–f) our top-500 “cognitive” articles, which had a percentile ranking ≥ 99.4 %. For the two panels within each row, the left panel shows the data for each of the six 5-year eras spanning 1950–1979, and the right panel shows the data for each of the five 5-year eras spanning 1980–2004.

As can be seen in Fig. 1, citations for post-1994 articles ranking in the 50th–75th and 90th–95th percentiles have generally continued to grow across each of their 3-year postpublication bins. This is likely because they have not been published long enough to reach their peaks. (The one exception to this general pattern is the 1995–1999 bin for articles ranking in the 50th to 75th percentiles, for which citations peaked in the 7- to 9-year postpublication bin and have remained constant thereafter.) However, for pre-1995 articles ranking in the 50th–75th and 90th–95th percentiles, citations generally peaked around 4–6 and 7–9 years after an article’s publication, respectively, at which point citations thereafter decreased linearly until reaching an asymptote. In contrast, for the top-500 articles, the pre-1980 articles’ citations increased up to a peak occurring from 10–18 years postpublication, then dropped slightly for a few years, and then started to increase again up to the present, whereas for post-1979 articles, citations have linearly increased up to the present. The pre-1980 top-500 pattern is likely due to a postpeak downturn having been offset by the greater citation opportunities from the rapidly increasing number of publications during their postpeak years, and the post-1979 pattern is likely also due to this changing environment, as well as to the fact that they may not have been published long enough to reach their peaks.

A reviewer questioned whether the large upturn in cites per year for the most recent years among the articles published in the 1950–1954 and 1955–1959 eras might be due to the pronounced positive skew in citations and to our having used mean citations per year. To address this question, all data points in Fig. 1 were recomputed using the medians rather than the means contributing to those values. That is, after obtaining the mean of the 3-year citation rates for each of the N articles in each bin, we examined the medians of those N means rather than the means of those N means (which are the data displayed in Fig. 1). The large upturn for the articles published in the 1950–1954 and 1955–1959 eras were significantly reduced when the medians were used, showing that the upturn observed for each of these two eras was produced by only a few articles that received very high citation rates in recent years. However, this difference between the mean versus the median data only occurred in the two aforementioned eras, likely because the data from those eras were based on many fewer articles than were the data for the other eras. (See Table 2.) For all of the other panels, the overall values for the means and medians were very similar. Another trend of interest for

the top-500 articles is that, for post-1974 articles, the number of citations per year in their first three postpublication years increased dramatically, to more than ten citations per year, as compared to articles from all previous eras, which averaged about five citations per year.

A comparison of our data with White’s (1983) data reveals that 18 of the 24 journal articles identified by White met our criteria for being a “cognitive” article. All 18 of these ranked in the top 36 of the 173 of our top-500 articles that were published between 1956 and 1978, the years covered by White. These 18 articles received 44.7 cites per year in 1979–1982 (the years analyzed by White) and 43 cites per year in 1983–2008. The mean cites per year for the remaining 155 articles from the same cohort in our top-500 list were 12.99 and 15.91 cites per year, respectively. Clearly, despite the limitations of White’s procedures, which were imposed by practical considerations, the articles that he identified were indeed among the most highly cited articles published in the years that he covered, and they exhibited a “staying power” comparable to that of the other 155 articles that our more extensive search procedures captured.

Our data are contrary to Standing’s (2009) data, which showed that mean citation rates for very prominent 1971–1976 cognitive psychology articles peaked 5–8 years following publication and then showed a gradual decrease up to 22 years postpublication. For the 59 articles from 1971 to 1976 on our top-500 list, no downturn in citations was indicated. Indeed, the highest number of mean citations (21.66) occurred in the 22nd postpublication year, and for the years beyond that, the mean citation rate of 25.68 in the 32th postpublication year was highest of all. A similar conclusion applies for the citation patterns of all the top-500 articles, not just those published between 1971 and 1976. However, as is shown in Fig. 1, Standing’s conclusion regarding an inverted-U-shaped citation function does generally hold for pre-1995 articles that rank between the 90th and 95th percentiles. The one exception was the 1950–1954 articles, of which with the exception of the first post-publication bin in Fig. 1, which had relatively constant citations across the earliest years before their citations began to decline, a pattern also observed for pre-1995 articles ranking in the 50th–75th percentiles (the exception being the 1950–1954 articles, which showed Standing’s inverted-U function).

Table 3 provides the distributions of the numbers of top-500 articles authored or coauthored by the 78 researchers with three or more top-500 articles, as well as the numbers of articles on which they were (a) the sole author, (b) the first author, or (c) a “junior” author. The 78 researchers represented in Table 3 had a total of 67 articles on which they were the sole author, and another 127 articles on which they were the first author. Thus, only 11 % of all of the authors of top-500 articles (i.e., 78 of 695) were primarily responsible for 39 % (194/500) of those articles. Clearly, the

Table 3 Distribution of the authors with three or more top-500 articles, the data from the supplemental HPOP search, the authorship arrangement of those articles, and their h-indices

Journal Articles in Top 500 in the WoS search						Supplemental HPOP Search						h-Index	
Number of Top-500 Articles	<i>N</i>	Authorship			Total	Journal ^a	Book ^b	Chapter	Authorship			Total	
		Sole	First	Other					Sole	First	Other		
9–12	3	6	13	13	32	23	2	10	5	16	14	35	83
7–8	4	6	7	18	31	2	1	7	1	5	4	10	61
6	5	7	12	11	30	2	2	7	5	5	1	11	45
5	6	6	16	8	30	3	9	2	9	3	2	14	60
4	20	12	34	34	80	8	19	13	19	13	8	40	54
3	40	30	45	45	120	12	27	32	43	20	8	71	49
Total	78	67	127	129	323	50	60	71	82	62	37	181	

N is the number of authors having the various numbers of top-500 WoS articles. The procedure for our supplemental search is found in Appendix B.

^a The Journal category includes technical reports ($n = 3$) and articles that we missed from the journals that we surveyed ($n = 5$); all other articles are from journals that we did not survey or from years that were missing in WoS. ^b Includes popular books (i.e., nonacademic books), of which there were very few.

field of cognitive psychology is being guided to a large degree by a small number of researchers.

To examine possible changes across years in the research areas that were being emphasized, we categorized the general research topic(s) covered in each of our top-500 articles and then aggregated them into five eras: (1) 1950–1969 (we combined the articles originating in the 1950s with those in the 1960s because there were too few articles in the former decade; total combined $N = 90$), (2) 1970–1979 ($N = 105$), (3) 1980–1989 ($N = 110$), (4) 1990–1999 ($N = 126$), and (5) 2000–2004 ($N = 69$). We will first consider four general categories: memory (including sensory memory, short-term memory, and episodic and semantic long-term memory), language (including reading and speech perception), attention/perception, and thinking (which includes decision making, reasoning, and problem solving).⁷ The percentages of top-500 articles on thinking and memory have remained relatively constant across eras; articles on language have shown an inverted-U function, peaking in the 1980s; and articles on attention/perception remained constant through the 1980s, but then showed substantial increases in the 1990s and 2000s.

As for research subcategories, the percentages of articles on information theory and psychophysics were appreciable in the 1950s and 1960s, but since then have been negligible. The percentages of top-500 articles on imagery and implicit long-term memory were noticeably higher in the 1980s than in the

other eras. The same general statement applies to semantic-priming, categorization, and decision-making articles, but with the 1980s–1990s being “high” points, and with the percentages of articles on categorization, implicit long-term memory, and decision making being higher than those for semantic priming and imagery. The percentage of top-500 articles on false memory was relatively high in the 1990s but negligible in other eras. Also of note is that no articles on embodied cognition or task switching appeared until the 1990s, when they made a substantial jump, and then a much bigger jump in the 2000s. Finally, the topic of short-term memory has shown an interesting evolution: The percentage of top-500 articles related to this topic was quite high from 1950 to 1970, then showed a precipitous drop in the 1980s, as predicted by Crowder (1982), but then showed a dramatic increase in the 1990s, and another dramatic increase in the 2000s. However, the nature of the post-1980s short-term memory research (which is called “working memory research”) represented in the top-500 list is quite different from that of the pre-1980s research. The post-1980s research focuses on how individual differences in short-term memory span measured under conditions of distraction (the so-called “operations span task”) are related to attentional control. The pre-1980s research mostly (but not exclusively) focused on the variables that affect memory span per se or on recency effects in immediate free-recall tests. The post-1980s increase in top-500 articles focusing on individual differences in working memory and attentional control has also occurred in language research. Finally, we note that research pertaining to aging peaked in the 1990s in the memory, language, and perception categories.

One potential caveat in interpreting the aforementioned changes in the representation of certain research areas across

⁷ Because we had great difficulty assigning some topics to one of these four general categories (e.g., imagery, embodied cognition, categorization, and motor skills, to name a few topics), we will not present detailed quantitative analyses, but rather will only speak in qualitative generalities and describe only those differences that were most salient to us. All statements regarding the topics covered in the various bins take into account the differing numbers of articles on our list from those bins.

the years is that these changes are based on our top-500 list, and not on all published articles. However, if an article on research topic X is being cited enough to make our top-500 list, this necessarily means that a large number of articles related to that topic are being published. Hence, we are confident that the conclusions that we have drawn accurately reflect the trends in the published literature at large.

Discussion

To our knowledge, this study is by far the most comprehensive citation analysis reported on the citation rates for psychology articles in any topic area. The data that we provide can be used in a variety of ways. Administrative officials and faculty committees that do not include cognitive psychologists but are making hiring decisions or tenure and promotion decisions for cognitive psychologists can use the percentile ranks for mean citations per year and total citations per article to assess more objectively and accurately the impact of the research of the candidates whom they are considering. Both researchers and nonresearchers (e.g., journalists) can also use this information to determine objectively the percentile ranking of an article that is receiving a certain number of citations per year. Specifically, people who read an article published in one of the 56 psychology journals listed in Table 1 that receives more than five citations per year will know that this article ranks somewhere between the 90th and 95th percentiles of all articles published in those journals. Thus, the research that such an article reports has been deemed to be important by the scientific community at large and has been viewed as being credible by other researchers in the field.

Our top-500 list can also perhaps serve as a valuable reference for a novice instructor teaching an advanced cognitive psychology course, or perhaps for a more experienced instructor in a history of psychology course. Young researchers and graduate students can also benefit from these data by using them to help determine previous and current fruitful research areas, thereby allowing young researchers to make informed decisions as to whether they want to resurrect an old but popular research area or follow the current zeitgeist.

Do citations measure quality?

Does a high number of citations for an article actually indicate that it is of high quality? One might argue that the opposite could be true in a few cases: a poorly executed study might be repeatedly cited as an example of what *not* to do. While this is plausible, we and others (Roediger, 2006; Rushton, 1984) believe that this is highly improbable. Although an initial brief flurry of articles may critique an article that has reported a controversial phenomenon that is in fact a procedural artifact, once it has been established that the phenomenon was indeed

based on flawed procedures, citations of the article reporting it would cease. Some empirical evidence also supports this belief. As cited in a report by the London School of Economics Public Policy Group (2011) that is titled *Maximizing the Impacts of Your Research: A Handbook for Social Scientists*, the Impact of Social Sciences Project reviewed 10,400 citations in social sciences articles and reported that only 10 of those citations were attributed to an article expressing negative commentary. These arguments notwithstanding, with respect to the quality issue, it must be acknowledged that citations directly measure only impact and are merely an indirect measure of research quality.

Although we believe that highly cited articles are indeed of high quality, this does not mean that modestly cited articles are of low quality. Flawlessly and even cleverly designed experiments that yield clean and decisive data may be only modestly cited, due to their being in a somewhat narrow research area that is being investigated by a small number of researchers. Alternatively, a seminal article that was highly cited for a decade or so after its publication may no longer be cited because it has been superseded by a more recent article that extends the seminal research or by a review article that integrates the seminal article's findings with more recent literature. In this case, the seminal article will not be cited, even though it is still having an indirect impact on research. Hence, although the total number of citations generally denotes the quality of the article, when an article is not well cited this does not necessarily imply that it is of low quality. However, for articles that have not been superseded by more recent articles, a low citation rate does indicate that the article is not having a major impact on the field in general. As always, defining the appropriate "cohort" is important. One needs to distinguish, for instance, whether a particular 1992 article on psychophysics is having a *general* impact (in which case the appropriate comparison group is all "cognitive" psychology articles, and the impact, as measured by citations, would be small, because psychophysics is a small field post-1990) or an important impact on psychophysics research (in which case, its citation rate should be compared to those of other psychophysics articles published around the same time).

Caveats in interpreting journal impact factors

A journal's immediate impact factor is provided in the Thomson Reuters *Journal Citation Reports* and is calculated by dividing the total number of current year citations the source items published in that journal during the previous two years by the number of articles that were published in that journal during the previous two years (Thomson Reuters, n.d.-a). Although a journal's immediate impact factor is often taken as a measure of its quality and importance to the field, our data raise two caveats regarding the interpretation of this measure. Specifically we focus on how the proliferation of journals and articles across years and how a very few highly influential articles published in a

journal (i.e., a positive skew) can affect a journal's immediate impact factor.

As is shown in Table 2, mean citations per year have been increasing over the years for all journals. Thus, the immediate impact factors of all journals are also increasing over time. For example, according to *Journal Citation Reports* (Thomson Reuters, n.d.-a), the immediate impact factors of *Journal of Memory and Language* in 2002, 2006, and 2010 were 2.08, 2.83, and 4.01, respectively. An increase in a journal's immediate impact factor over time is to be expected, according to the findings by Althouse, West, Bergstrom, and Bergstrom (2009) that the annual growth rate of psychology journals from 1995 to 2004 was 3.3 %. Another factor contributing to the increasing mean citations per year is the increasing length of the reference lists of articles over time (Adair & Vohra, 2003). Thus, to determine whether an increase in a journal's immediate impact factor for year Y relative to year X is due to factors other than a proliferation of new journals, one needs to focus on the magnitude of this increase relative to other similar journals in the discipline. We believe that the best way to do this is to compute that journal's z score within the distribution of immediate impact factors for all of the journals in its cohort for year X and for year Y, and then to compare these two z scores.

Our finding that there is a strong positive skew in citation data serves as another caveat for interpreting a journal's immediate impact factor. Because a journal's immediate impact factor is based on the mean of a small number of journal articles published in the previous 2 years, it can be affected to a large degree by a few highly cited articles that happened to be published in the previous 2 years. As is shown in Table 1, some journals have published a few articles that are cited much more than most of the other articles in those journals. This would inflate a journal's immediate impact factor. For example, using our data, *American Psychologist's* 2002 impact factor was 4.50, and its 2004 impact factor was 3.10. This finding is intriguing, considering that most journals' impact factors should increase, not decrease, over time (see Althouse et al., 2009). The reason that *American Psychologist's* impact factor was higher in 2002 than in 2004 is because the former impact factor included two articles published in 2000 and 2001 that received 42 and 28 citations, respectively, in 2002. However, because no article published in 2002 or 2003 received more than 14 citations in 2004, the latter impact factor was lower. (See the 2005 editorial "Not-So-Deep Impact" for a similar analysis applied to *Nature*.) The instability of immediate impact factors has led the *Journal Citation Report* to supplement the traditional 2-year impact factor with a 5-year impact factor, which ameliorates but does not eliminate the problem.

A recent article by Hegarty and Walton (2012) examined nine factors that predict an article's citation count. Of the nine factors, the number of references in an article was the strongest predictor, $\beta = .25$; the second strongest predictor was the year in which the article was published, $\beta = .23$,

which is congruent with the present results showing that more recent articles receive more cites per year. Both of these predictors were better predictors of citation counts than was a journal's impact factor, $\beta = .15$. However, it should be noted that although the authors sampled a journal from each of the subdisciplines of psychology defined by the *Web of Knowledge*, they based their citation counts on the *PsycINFO* database,⁸ and sampled a limited number of articles (1,147) in a limited number of years (1996–2005) from a limited number of journals (nine).

Limitations of the present approach

An obvious and important limitation of the present data is that we excluded journals and articles that employed neuroimaging and electrophysiological techniques. With the refinement of and increased availability of these methods in the past decade, it is likely that the number of such articles will increase even more dramatically over the next decade. Given that the immediate impact factors of neuroscience journals are considerably higher than those of journals that publish behavioral "cognitive" articles, the inclusion of cognitive psychology articles that use imaging and electrophysiological measures to assess the impact of "cognitive" articles, as defined here, would be misguided in the same way that including articles from all areas of cognitive psychology to assess the impact of articles within the subdiscipline of psychophysics would be misguided. Thus, we leave it to future research to use our methods for identifying the highest-impact cognitive neuroscience articles. A comparison of the citation rates and of their temporal patterns for behavioral cognitive research and cognitive neuroscience research would also be of considerable interest.

Although our analysis of "cognitive" articles is comprehensive, it is not entirely complete. We likely failed to find some "cognitive" journal articles that should be in our top-500 list because, as noted earlier, we were unable to obtain the complete record of some of the journals that we included in our sample (see Table 1). In such instances, we supplemented our WoS search using the Journal Impact analysis component of Harzing's Publish or Perish software (2007; HPOP), version 3.4.4351 (which accesses data from *Google Scholar*), to search for articles in those missing years that might have qualified for entry into our top-500 list. We also used HPOP data for the aforementioned excluded journals, *Journal of Research in Reading* and *Thinking & Reasoning*. To take into account the fact that citation counts in Google Scholar are almost always greater than those obtained in WoS (and often by a considerable number; see the supplemental materials for Nosek et al., 2010), we only considered an article listed in Appendix B to have

⁸ From the authors' anecdotal experience, the citation counts retrieved using *PsychINFO* are often considerably smaller than those retrieved using WoS.

qualified for our “top-500” list if it received a mean citations-per-year value that was 20 % higher than that of the lowest-cited article in its era, shown in the last column of Table 2. (Hereafter, we will present “top-500” in quotes, as in the previous sentence, when it refers to all articles in both our original top-500 list and the supplemental articles listed in Appendix B.) Appendix B lists these 13 missed articles, which represent 2.6 % of the 500 articles on our original list that were missed because of our incomplete WoS version.

Another reason why we likely missed highly cited “cognitive” articles is that we did not include high-impact journals, such as *Science* and *Nature*, that only rarely publish articles relevant to “cognitive” articles. For example, an article published in *Science* by Shepard and Metzler (1971), on mental rotation, and another in *Nature* by Luck and Vogel (1997), on visual working memory, have 65 and 37 mean citations per year, respectively, and would have made our top-500 list. Although a number of other *Science* and *Nature* articles likely would have also made our list, we did not include them because, at present, WoS does not categorize articles into subcategories. Because *Science* and *Nature* have each published more than 49,000 articles between 1950 and 2004, and most of these articles tend to be very highly cited, to create our original top-500 list it would have been impractical for us to manually cull and remove all of these irrelevant, more highly cited articles so as to find the relevant “cognitive” articles.

Another potential limitation of our method is that we did not include books or chapters in our database. Although one can access citations to some chapters or books in WoS, this can only be done by entering the names of individual authors. Clearly, it would be impractical to do this for the thousands of cognitive psychologists who published between 1950 and 2004. However, we do note that a book, Neisser’s (1967) *Cognitive Psychology*, which arguably launched the field of behavioral cognitive psychology as it exists today, has received a mean of 131 citations per year in HPOP. Because it was impractical to include books, chapters, and journals that only infrequently publish “cognitive” articles, we supplemented our top-500 list by conducting the practically possible individual searches for each of the 78 authors in our Table 3 (i.e., researchers who authored three or more top-500 articles) using HPOP to identify articles, books, and book chapters that they had published that would have made it into our top-500 list had they been included. Once again, we used the “20 %-greater” criterion described earlier. The right side of Table 3 displays the relevant data. We found that the top 78 authors produced a total of 181 highly cited journal articles, books, and chapters that were missed by our WoS search, with 50 of these being journal articles. The 50 articles came from a total of 28 different journals, with *Science* accounting for the highest proportion (18 %), and the *American Economic Review* and *Quarterly Journal of Economics* tying for the second-highest proportion (8 %). Thus, the WoS search missed 13.4 % (i.e., 50/[50 +

323]) of the highly cited journal articles by these 78 authors. The three top authors, who produced 9.9 % (i.e., 32 of 323) of the top-500 articles from our WoS search procedures, accounted for 46 % (i.e., 23 of 50) of all of the additional highly cited journal articles that we identified in our supplemental search. It is also noteworthy that, whereas the WoS search missed 41 % (i.e., 23 of [32 + 23]) of these three authors’ very highly cited journal articles, it only missed from 6.1 % to 9.8 % of the highly cited journal articles in the remaining five frequency categories in rows 2–6 of Table 3. This suggests that the most highly eminent cognitive psychologists publish a high percentage of their highly cited articles in journals other than mainstream cognitive psychology journals. Other notable features of the data provided by the supplemental HPOP search for the top 78 highly cited authors were as follows. (1) Of their 500 total publications that qualify as among the most highly cited (i.e., have mean citation rates in the top 0.6 % of the most highly cited articles identified in our original WoS search), 74 % were journal articles, 12 % were books, and 14 % were book chapters. (2) Under the reasonable assumption that considerably fewer than 12 % of cognitive psychologists’ publications are books, this indicates that books garner many more citations than do journal articles. It is also interesting that these data seem to suggest that book chapters, which many believe have much less impact on average than do journal articles, are not underrepresented in these authors’ highly cited works. (This is under the assumption that no more than 12 % of these authors’ total publications are book chapters.) (3) As one moves from the top row of Table 3 (authors with 9–12 top-500 articles) to the bottom row (authors with three top-500 articles), there is a monotonic decrease in the percentage of their total highly cited works that are journal articles (from 82 % down to 69 %).⁹ (4) For the 12 authors with 6–12 top-500 journal articles in the WoS search, 17 % of the highly cited works that are not journal articles are books, and the other 83 % are book chapters, whereas for the 66 authors with 3–5 top-500 journal articles in the WoS search, 54 % are books and 46 % are book chapters. This could be due to the high visibility of the 12 top authors leading to their being more likely to be invited to contribute chapters in edited volumes published by high prestige publishing houses.

The last column of Table 3 provides the average h-index for the authors who make up each category. Each author’s h-index, which included books and chapters as well as journal articles, was obtained using HPOP after imposing the restriction of considering only articles published before 2005. (This restriction was used so as to be consistent with our evaluating only articles published before 2005.) The average h-index for all 78 authors was 53, and the median was 50. It is

⁹ The 82 % value for the top three most cited authors is inflated, because eight of these publications were coauthored by two of these authors and were counted twice, once for each author.

important to keep in mind that these 78 authors can be considered to be the *crème de la crème* of prominent cognitive psychologists, and thus that their h-indices are expected to be much higher than those of other quite prominent researchers in the field. Authors with more top-500 papers generally had higher h-indices, with the exception of authors with six top-500 articles, whose h-indices were lower than those in the categories above and below them. Also, the data in the top four categories should be interpreted with caution because of their small sample sizes. At the individual-author level, there was a positive correlation between an author's h-index and the total number of the articles that the author had on the "top-500" list, $r(76) = .590, p < .001$. (As is indicated in Table 3, the range in the number of top-cited articles was 3–12; the range in the 78 h-indices was 19–128. Our speculation is that had the correlation been based on researchers having three or more articles in the top 10 % of most-cited articles, the correlation would have been considerably higher.)

One could argue that the fact that we did not exclude self-citations would inflate the number of "true" citations that an article had received. While this would undoubtedly substantially affect the articles with only a few citations (most of which might be from one of the authors of the article being cited), it should have a very small effect for articles making our "top-500" list. In a related vein, Endler (1977) reported that the correlation between total citations and the total citations excluding self-citations for faculty members across 35 psychology departments was a remarkable .994. With respect to self-citations in journals (i.e., an article published in a journal citing another article from the same journal), Thomson Reuters (n.d.–b) sampled 5,876 journals across different disciplines and reported "a very weak negative correlation between Impact Factor and self-citation ($R^2 = 0.0368$). These data indicate that the inclusion of self-citations in our study does not invalidate it. (See Wilhite & Fong, 2012, for a recent controversy regarding journal self-citations and coercive citation practices.)

Another caveat pertains to evaluating a researcher's rather than a journal's impact. Our list of the 78 researchers having three or more articles on our "top-500" list represents (positively) deviant outliers based on an arbitrary cutoff, and hence likely misses a number of researchers who may have published a large number of articles ranking in the 95th–99.4th percentiles. However, if one wants to determine if a specific researcher who did not author one of our "top-500" articles is nevertheless having a major impact by publishing a large number of papers ranking in the top 5%, that researcher's name can be used in an Author Impact analysis using the HPOP program (Harzing, 2007), which provides the mean cites per year received by each of that author's articles (including books and chapters). These values can then be compared to the values in Table 2 to determine how many of that person's articles rank in the top 5 %, although one must take into account the fact that HPOP citation counts are often considerably higher than WoS citation counts. Unlike

WoS, which only provides a researcher's h-index, HPOP also provides other measures of impact, such as the e- and g-indices (Egghe, 2006; Zhang, 2009). These measures distinguish researchers who may have produced a few very highly cited articles from those who have produced a larger number of more moderately cited articles, an aspect of a researcher's citation profile that is missed by the h-index. In this regard, we note that Nosek et al. (2010) created a database in which one can compare his or her h- and e-indices to those of 611 faculty members from various social-personality psychology Ph.D. programs who received their Ph.D.s at the same time as the person doing the query. We hope that an analogous database will be created for the subarea of cognitive psychology.

Future research

Although we have identified over 500 "cognitive" psychology articles that rank in the top 1 % of the most highly cited articles published between 1950 and 2004 in 56 journals, we have not performed the analyses necessary to determine which factors are predictive of an article achieving this elite level of citation counts. As noted earlier, an analysis (though quite limited in scope) of the factors predictive of citation counts for journal articles has recently been reported by Hegarty and Walton (2012) for articles taken from various subdisciplines in psychology. What would be of interest would be a larger-scope survey that could determine whether the factors that affect citation counts differ for the different subdisciplines. A brief list of questions that might be considered would include the age and sex of the first author; whether the research was based on a dissertation (see Roediger, 2004); the number of authors, article length, and number of references; the content of the article's title or abstract; the academic "genealogy" of the authors; and the natures of the institutions at which research was conducted. Also of interest would be whether the citation rates for the top 1 % of the most highly cited articles could be predicted from regression equations based on the citation rates for articles ranking 95 % or below, or whether, because of the strong positive skew of the citation distribution, these top 1 % are somehow qualitatively different.

Conclusion

Although not all of our findings may generalize to other areas of psychology, or even to other subdisciplines in cognitive psychology (e.g., articles that focus on the neural bases of cognition), we believe that a number of our conclusions are applicable to other areas of psychology. For example, our data showing that half of all of the articles that we sampled received less than half a citation per year are congruent with the conclusion reached by Harzing (2010), who sampled articles in the social sciences and humanities. But even if the present results

do not generalize to other areas of psychology (which would be interesting), we believe that they provide a considerable amount of useful, interesting, and objective information regarding (a) the most-cited “cognitive” psychology journal articles, (b) the changes that have occurred in the research areas of the articles that are very highly cited, and (c) the percentile ranking that an article achieves relative to other articles published in the same era based on its mean citations per year. We thus hope that our

study will encourage other researchers to conduct similar studies in their areas or disciplines, so as to assess the generalizability of the results that we have reported here.

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Appendix A

The 500 articles with the highest mean citations per year, arranged in ascending order by eras, and within each era in descending order of mean cites per year

Author(s)	Title	Journal ^a	Year	Cites/Year
1950–1954				
Fitts, PM	The information capacity of the human motor system in controlling the amplitude of movement	<i>JEP</i>	1954	29.20
Attneave, F	Some informational aspects of visual perception	<i>Psych Rev</i>	1954	17.42
Hick, WE	On the rate of gain of information	<i>QJEP</i>	1952	14.32
Edwards, W	The theory of decision making	<i>Psych Bull</i>	1954	13.42
Hyman, R	Stimulus information as a determinant of reaction time	<i>JEP</i>	1953	9.63
Tanner, WP; Swets, JA	A decision-making theory of visual detection	<i>Psych Rev</i>	1954	9.31
Noble, CE	An analysis of meaning	<i>Psych Rev</i>	1952	8.67
Wallach, H; Oconnell, DN	The kinetic depth effect	<i>JEP</i>	1953	8.27
Fitts, PM; Seeger, CM	S–R compatibility: Spatial characteristics of stimulus and response codes	<i>JEP</i>	1953	7.98
1955–1959				
Miller, GA	The magical number 7, plus or minus 2: Some limits on our capacity for processing information	<i>Psych Rev</i>	1956	92.36
Stevens, SS	On the psychophysical law	<i>Psych Rev</i>	1957	26.96
Peterson, LR; Peterson, MJ	Short-term retention of individual verbal items	<i>J Exp Psych</i>	1959	26.80
Easterbrook, JA	The effect of emotion on cue utilization and the organization of behavior	<i>Psych Rev</i>	1959	22.96
Bruner, JS	On perceptual readiness	<i>Psych Rev</i>	1957	16.83
Stevens, SS; Galanter, EH	Ratio scales and category scales for a dozen perceptual continua	<i>JEP</i>	1957	13.08
Gibson, JJ; Gibson, EJ	Perceptual learning: Differentiation or enrichment	<i>Psych Rev</i>	1955	11.71
Brown, J	Some tests of the decay theory of immediate memory	<i>QJEP</i>	1958	11.71
Deese, J	On the prediction of occurrence of particular verbal intrusions in immediate recall	<i>JEP</i>	1959	11.66
Simon, HA	Rational choice and the structure of the environment	<i>Psych Rev</i>	1956	8.66
Guilford, JP	Three faces of intellect	<i>Amer Psych</i>	1959	7.82
Lieberman, AM; Harris, KS; Hoffman, HS; Griffith, BC	The discrimination of speech sounds within and across phoneme boundaries	<i>JEP</i>	1957	7.81
Stevens, SS	The direct estimation of sensory magnitudes: Loudness	<i>Amer J Psych</i>	1956	7.57
Attneave, F; Arnoult, MD	The quantitative study of shape and pattern perception	<i>Psych Bull</i>	1956	6.96
1960–1964				
Conrad, R	Acoustic confusions in immediate memory	<i>Brit J Psych</i>	1964	18.76
Swets, JA; Tanner, WP; Birdsall, TG	Decision processes in perception	<i>Psych Rev</i>	1961	13.27
Mednick, SA	The associative basis of the creative process	<i>Psych Rev</i>	1962	13.15
Deutsch, JA; Deutsch, D	Attention: Some theoretical considerations	<i>Psych Rev</i>	1963	12.17

Tulving, E	Subjective organization in free recall of unrelated words	<i>Psych Rev</i>	1962	10.98
Kendler, HH; Kendler, TS	Vertical and horizontal processes in problem-solving	<i>Psych Rev</i>	1962	10.74
Fitts, PM; Peterson, JR	Information capacity of discrete motor responses	<i>JEP</i>	1964	9.71
Bruner, JS	The course of cognitive growth	<i>Amer Psych</i>	1964	9.44
Melton, AW	Implications of short-term memory for a general theory of memory	<i>JML</i>	1963	9.24
Gibson, JJ	Observations on active touch	<i>Psych Rev</i>	1962	8.19
Murdock, BB	Serial position effect of free recall	<i>JEP</i>	1962	8.15
Keppel, G; Underwood, BJ	Proactive inhibition in short-term retention of single items	<i>JML</i>	1962	7.74
Wason, PC	On the failure to eliminate hypotheses in a conceptual task	<i>QJEP</i>	1960	7.59
Klein, GS	Semantic power measured through the interference of words with color naming	<i>Amer J Psych</i>	1964	7.33
Edwards, W	Behavioral decision theory	<i>Ann Rev Psych</i>	1961	7.17
Campbell, DT	Blind variation and selective retention in creative thought as in other knowledge processes	<i>Psych Rev</i>	1960	6.92
Neisser, U	Decision-time without reaction-time: Experiments in visual scanning	<i>Amer J Psych</i>	1963	6.78
Conrad, R; Hull, AJ	Information, acoustic confusion and memory span	<i>Brit J Psych</i>	1964	6.64
Treisman, AM	Contextual cues in selective listening	<i>QJEP</i>	1960	6.59
Miller, GA	Some psychological studies of grammar	<i>Amer Psych</i>	1962	6.13
Hirsh, IJ; Sherrick, CE	Perceived order in different sense modalities	<i>JEP</i>	1961	5.92
Yntema, DB; Trask, FP	Recall as a search process	<i>JML</i>	1963	5.72
Kleinsmith, LJ; Kaplan, S	Paired-associate learning as a function of arousal and interpolated interval	<i>JEP</i>	1963	5.26
Restle, F	The selection of strategies in cue learning	<i>Psych Rev</i>	1962	5.04
1965–1969				
Sternberg, S	Discovery of processing stages: Extensions of Donders' method	<i>Acta Psych</i>	1969	38.78
Lieberman, AM; Cooper, FS; Shankweiler, DP; Studdert-Kennedy, M	Perception of speech code	<i>Psych Rev</i>	1967	32.79
Morton, J	Interaction of information in word recognition	<i>Psych Rev</i>	1969	28.05
Collins, AM; Quillian, MR	Retrieval time from semantic memory	<i>JML</i>	1969	22.25
Waugh, NC; Norman, DA	Primary memory	<i>Psych Rev</i>	1965	21.14
Posner, MI; Keele, SW	On genesis of abstract ideas	<i>JEP</i>	1968	17.88
Yin, RK	Looking at upside-down faces	<i>JEP</i>	1969	17.60
Tversky, A	Intransitivity of preferences	<i>Psych Rev</i>	1969	17.55
Tulving, E; Pearlstone, Z	Availability versus accessibility of information in memory for words	<i>JML</i>	1966	17.53
Shepard, RN	Recognition memory for words sentences and pictures	<i>JML</i>	1967	14.55
Paivio, A	Mental imagery in associative learning and memory	<i>Psych Rev</i>	1969	14.38
Brown, R; McNeill, D	Tip of tongue phenomenon	<i>JML</i>	1966	14.09
Crowder, RG; Morton, J	Precategorical acoustic storage (PAS)	<i>Perc & Psychophys</i>	1969	14.05
Sachs, JS	Recognition memory for syntactic and semantic aspects of connected discourse	<i>Perc & Psychophys</i>	1967	13.12
Treisman, AM	Strategies and models of selective attention	<i>Psych Rev</i>	1969	13.05
Posner, MI; Mitchell, RF	Chronometric analysis of classification	<i>Psych Rev</i>	1967	12.62
Keele, SW	Movement control in skilled motor performance	<i>Psych Bull</i>	1968	12.54
Glanzer, M; Cunitz, AR	Two storage mechanisms in free recall	<i>JML</i>	1966	12.40
Underwood, BJ	Attributes of memory	<i>Psych Rev</i>	1969	10.85
Reicher, GM	Perceptual recognition as a function of meaningfulness of stimulus material	<i>JEP</i>	1969	10.35
Kahneman, D	Method findings and theory in studies of visual masking	<i>Psych Bull</i>	1968	10.15
Jensen, AR; Rohwer, WD	Stroop color-word test: A review	<i>Acta Psych</i>	1966	9.28
Underwood, BJ	False recognition produced by implicit verbal responses	<i>JEP</i>	1965	9.25
Parducci, A	Category judgment: A range-frequency model	<i>Psych Rev</i>	1965	8.80

Peterson, CR; Beach, LR	Man as an intuitive statistician	<i>Psych Bull</i>	1967	8.74
Norman, DA	Toward a theory of memory and attention	<i>Psych Rev</i>	1968	8.54
Reber, AS	Implicit learning of artificial grammars	<i>JML</i>	1967	8.26
Clark, HH	Linguistic processes in deductive reasoning	<i>Psych Rev</i>	1969	8.23
Oldfield, RC; Wingfield, A	Response latencies in naming objects	<i>QJEP</i>	1965	7.95
Wason, PC	Reasoning about a rule	<i>QJEP</i>	1968	7.68
Levine, M	Hypothesis behavior by humans during discrimination learning	<i>JEP</i>	1966	7.65
Poulton, EC	New psychophysics: Six models for magnitude estimation	<i>Psych Bull</i>	1968	7.37
Harris, CS	Perceptual adaptation to inverted, reversed, and displaced vision	<i>Psych Rev</i>	1965	6.93
Smith, EE	Choice reaction time: An analysis of major theoretical positions	<i>Psych Bull</i>	1968	6.88
Sternberg, S	Two operations in character recognition: Some evidence from reaction-time measurements	<i>Perc & Psychophys</i>	1967	6.83
Keele, SW; Posner, MI	Processing of visual feedback in rapid movements	<i>JEP</i>	1968	6.51
Hyde, TS; Jenkins, JJ	Differential effects of incidental tasks on organization of recall of a list of highly associated words	<i>JEP</i>	1969	6.30
Shankweiler, DP; Studdert-Kennedy, M	Identification of consonants and vowels presented to left and right ears	<i>QJEP</i>	1967	6.29
Bower, GH; Clark, MC; Lesgold, AM; Winzenz, D	Hierarchical retrieval schemes in recall of categorized word lists	<i>JML</i>	1969	6.25
Bamber, D	Reaction times and error rates for same-different judgments of multidimensional stimuli	<i>Perc & Psychophys</i>	1969	5.98
Ekstrand, BR; Wallace, WP; Underwood, BJ	A frequency theory of verbal-discrimination learning	<i>Psych Rev</i>	1966	5.88
Rabbitt, PMA	Errors and error correction in choice-response tasks	<i>JEP</i>	1966	5.84
Simon, Jr	Reactions toward source of stimulation	<i>JEP</i>	1969	5.73
1970–1974				
Craik, FIM; Lockhart, RS	Levels of processing: A framework for memory research	<i>JML</i>	1972	87.08
Tversky, A; Kahneman, D	Availability: Heuristic for judging frequency and probability	<i>Cog Psych</i>	1973	51.11
Tulving, E; Thomson, DM	Encoding specificity and retrieval processes in episodic memory	<i>Psych Rev</i>	1973	42.89
Kahneman, D; Tversky, A	Psychology of prediction	<i>Psych Rev</i>	1973	41.08
Eriksen, BA; Eriksen, CW	Effects of noise letters upon identification of a target letter in a nonsearch task	<i>Perc & Psychophys</i>	1974	31.69
Laberge, D; Samuels, SJ	Toward a theory of automatic information processing in reading	<i>Cog Psych</i>	1974	29.60
Chase, WG; Simon, HA	Perception in chess	<i>Cog Psych</i>	1973	27.11
Meyer, DE; Schvaneveldt, RW	Facilitation in recognizing pairs of words: Evidence of a dependence between retrieval operations	<i>JEP</i>	1971	26.24
Tversky, A	Elimination by aspects: Theory of choice	<i>Psych Rev</i>	1972	24.19
Johansson, G	Visual-perception of biological motion and a model for its analysis	<i>Perc & Psychophys</i>	1973	23.19
Kahneman, D; Tversky, A	Subjective probability: Judgment of representativeness	<i>Cog Psych</i>	1972	23.00
Bransford, JD; Johnson, MK	Contextual prerequisites for understanding: Some investigations of comprehension and recall	<i>JML</i>	1972	20.59
Smith, EE; Shoben, EJ; Rips, LJ	Structure and process in semantic memory: Featural model for semantic decisions	<i>Psych Rev</i>	1974	18.54
Posner, MI; Boies, SJ	Components of attention	<i>Psych Rev</i>	1971	17.68
Tversky, A; Kahneman, D	Belief in law of small numbers	<i>Psych Bull</i>	1971	17.24
Buschke, H	Selective reminding for analysis of memory and learning	<i>JML</i>	1973	16.86
Bransford, JD; Franks, JJ	Abstraction of linguistic ideas	<i>Cog Psych</i>	1971	16.53
Pylyshyn, ZW	What mind's eye tells minds brain: Critique of mental imagery	<i>Psych Bull</i>	1973	16.17
Lieberman, IY; Shankweiler, D; Fischer, FW; Carter, B	Explicit syllable and phoneme segmentation in young child	<i>J Exp Child Psych</i>	1974	15.74
Turvey, MT	Peripheral and central processes in vision: Inferences from an information-processing analysis of masking with patterned stimuli	<i>Psych Rev</i>	1973	14.72
Roenker, DL; Thompson, CP; Brown, SC	Comparison of measures for estimation of clustering in free recall	<i>Psych Bull</i>	1971	13.92
Haviland, SE; Clark, HH	What's new: Acquiring new information as a process in comprehension	<i>JML</i>	1974	13.43

Appelle, S	Perception and discrimination as a function of stimulus orientation: Oblique effect in man and animals	<i>Psych Bull</i>	1972	12.89
Anderson, JR; Bower, GH	Recognition and retrieval processes in free-recall	<i>Psych Rev</i>	1972	11.95
Bransford, JD; Barclay, JR; Franks, JJ	Sentence memory: Constructive versus interpretive approach	<i>Cog Psych</i>	1972	11.86
Rips, LJ; Shoben, EJ; Smith, EE	Semantic distance and verification of semantic relations	<i>JML</i>	1973	11.81
Rosch, EH	Natural categories	<i>Cog Psych</i>	1973	11.61
Lichtenstein, S; Slovic, P	Reversals of preference between bids and choices in gambling decisions	<i>JEP</i>	1971	11.58
Pascual-Leone, J	A mathematical model for transition rule in Piaget's developmental stages	<i>Acta Psych</i>	1970	11.13
Reed, SK	Pattern recognition and categorization	<i>Cog Psych</i>	1972	10.92
Loftus, EF; Palmer, JC	Reconstruction of automobile destruction: Example of interaction between language and memory	<i>JML</i>	1974	10.89
Wickens, DD	Encoding categories of words: Empirical approach to meaning	<i>Psych Rev</i>	1970	10.82
Clark, HH; Chase, WG	Process of comparing sentences against pictures	<i>Cog Psych</i>	1972	10.70
Marks, DF	Visual imagery differences in recall of pictures	<i>Brit J Psych</i>	1973	10.58
Wing, AM; Kristofferson, AB	Response delays and timing of discrete motor responses	<i>Perc & Psychophys</i>	1973	10.50
Forster, KI; Chambers, SM	Lexical access and naming time	<i>JML</i>	1973	9.97
Rundus, D	Analysis of rehearsal processes in free recall	<i>JEP</i>	1971	9.53
Phillips, WA	Distinction between sensory storage and short-term visual memory	<i>Perc & Psychophys</i>	1974	9.23
Wheeler, DD	Processes in word recognition	<i>Cog Psych</i>	1970	9.13
Eriksen, CW; Hoffman, JE	Extent of processing of noise elements during selective encoding from visual displays	<i>Perc & Psychophys</i>	1973	8.97
Eriksen, CW; Hoffman, JE	Temporal and spatial characteristics of selective encoding from visual displays	<i>Perc & Psychophys</i>	1972	8.84
Erdelyi, MH	New look at new look: Perceptual defense and vigilance	<i>Psych Rev</i>	1974	8.26
Anderson, NH	Functional measurement and psychophysical judgment	<i>Psych Rev</i>	1970	8.10
Posner, MI; Keele, SW	Retention of abstract ideas	<i>JEP</i>	1970	7.92
Milner, PM	Model for visual shape recognition	<i>Psych Rev</i>	1974	7.80
Meyer, DE; Schvaneveldt, RW; Ruddy, MG	Functions of graphemic and phonemic codes in visual word recognition	<i>Mem & Cog</i>	1974	7.77
Stevens, SS	Issues in psychophysical measurement	<i>Psych Rev</i>	1971	7.71
Bregman, AS; Campbell, J	Primary auditory stream segregation and perception of order in rapid sequences of tones	<i>JEP</i>	1971	7.71
Garner, WR; Felfoldy, GL	Integrality of stimulus dimensions in various types of information processing	<i>Cog Psych</i>	1970	7.54
Rubenstein, H; Lewis, SS; Rubenstein, MA	Evidence for phonemic recording in visual word recognition	<i>JML</i>	1971	7.50
Craik, FIM; Watkins, MJ	Role of rehearsal in short-term memory	<i>JML</i>	1973	7.28
Bjork, RA; Whitten, WB	Recency-sensitive retrieval processes in long-term free recall	<i>Cog Psych</i>	1974	7.23
1975–1979				
Nisbett, RE; Wilson, TD	Telling more than we can know: Verbal reports on mental processes	<i>Psych Rev</i>	1977	94.28
Shiffrin, RM; Schneider, W	Controlled and automatic human information processing: II. Perceptual learning, automatic attending, and a general theory	<i>Psych Rev</i>	1977	79.47
Tversky, A	Features of similarity	<i>Psych Rev</i>	1977	64.22
Schneider, W; Shiffrin, RM	Controlled and automatic human information Processing: I. Detection, search, and attention	<i>Psych Rev</i>	1977	64.09
Collins, AM; Loftus, EF	Spreading activation theory of semantic processing	<i>Psych Rev</i>	1975	63.74
Hasher, L; Zacks, RT	Automatic and effortful processes in memory	<i>JEP:Gen</i>	1979	53.13
Kintsch, W; Vandijk, TA	Toward a model of text comprehension and production	<i>Psych Rev</i>	1978	50.13
Rosch, E; Mervis, CB; Gray, WD; Johnson, DM; Boyesbraem, P	Basic objects in natural categories	<i>Cog Psych</i>	1976	49.73
Craik, FIM; Tulving, E	Depth of processing and retention of words in episodic memory	<i>JEP:Gen</i>	1975	44.82
Rosch, E; Mervis, CB	Family resemblances: Studies in internal structure of categories	<i>Cog Psych</i>	1975	43.56

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Medin, DL; Schaffer, MM	Context theory of classification learning	<i>Psych Rev</i>	1978	34.52
Rosch, E	Cognitive representations of semantic categories	<i>JEP:Gen</i>	1975	34.06
Navon, D	Forest before trees: Precedence of global features in visual-perception	<i>Cog Psych</i>	1977	31.63
Mandler, JM	Remembrance of things past: Story structure and recall	<i>Cog Psych</i>	1977	28.16
Norman, DA; Bobrow, DG	Data-limited and resource-limited processes	<i>Cog Psych</i>	1975	27.44
Schmidt, RA	Schema theory of discrete motor skill learning	<i>Psych Rev</i>	1975	27.12
Bower, GH; Black, JB; Turner, TJ	Scripts in memory for text	<i>Cog Psych</i>	1979	24.33
McClelland, JL	Time relations of mental processes: Examination of systems of processes in cascade	<i>Psych Rev</i>	1979	23.60
Ratcliff, R	Theory of memory retrieval	<i>Psych Rev</i>	1978	23.06
Morris, CD; Bransford, JD; Franks, JJ	Levels of processing versus transfer appropriate processing	<i>JML</i>	1977	22.78
Breitmeyer, BG; Ganz, L	Implications of sustained and transient channels for theories of visual-pattern masking, saccadic suppression, and information-processing	<i>Psych Rev</i>	1976	21.18
Baddeley, AD; Thomson, N; Buchanan, M	Word length and structure of short-term-memory	<i>JML</i>	1975	20.94
Navon, D; Gopher, D	Economy of the human-processing system	<i>Psych Rev</i>	1979	20.77
Flavell, JH	Meta-cognition and cognitive monitoring: New area of cognitive-developmental inquiry	<i>Amer Psych</i>	1979	20.57
Thorndyke, PW	Cognitive structures in comprehension and memory of narrative discourse	<i>Cog Psych</i>	1977	20.25
Fischhoff, B	Hindsight not equal to foresight: Effect of outcome knowledge on judgment under uncertainty	<i>JEP:HPP</i>	1975	19.88
Slamecka, NJ; Graf, P	Generation effect: Delineation of a phenomenon	<i>JEP:LMC</i>	1978	19.58
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Pribram, KH; McGuinness, D	Arousal, activation, and effort in control of attention	<i>Psych Rev</i>	1975	18.88
Scarborough, DL; Cortese, C; Scarborough, HS	Frequency and repetition effects in lexical memory	<i>JEP:HPP</i>	1977	18.38
Marslenwilson, WD; Welsh, A	Processing interactions and lexical access during word recognition in continuous speech	<i>Cog Psych</i>	1978	17.74
Slovic, P; Fischhoff, B; Lichtenstein, S	Behavioral decision-theory	<i>Ann Rev Psych</i>	1977	17.66
Sternberg, S	Memory scanning: New findings and current controversies	<i>QJEP</i>	1975	17.53
Glushko, RJ	Organization and activation of orthographic knowledge in reading aloud	<i>JEP:HPP</i>	1979	17.37
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Loftus, EF; Miller, DG; Burns, HJ	Semantic integration of verbal information into a visual memory	<i>JEP:LMC</i>	1978	17.06
Lee, DN	Theory of visual control of braking based on information about time-to-collision	<i>Perc</i>	1976	16.39
Eriksen, CW; Schultz, DW	Information-processing in visual-search: Continuous-flow conception and experimental results	<i>Perc & Psychophys</i>	1979	15.50
Vandenberg, SG; Kuse, AR	Mental rotations, a group test of 3-dimensional spatial visualization	<i>Perc Mot Skills</i>	1978	15.03
Anderson, JR	Arguments concerning representations for mental imagery	<i>Psych Rev</i>	1978	14.52
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Rosch, E	Cognitive reference points	<i>Cog Psych</i>	1975	11.15
Neill, WT	Inhibitory and facilitatory processes in selective attention	<i>JEP:HPP</i>	1977	11.00

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Rayner, K	Eye-movements in reading and information processing	<i>Psych Bull</i>	1978	10.32
Posner, MI; Nissen, MJ; Klein, RM	Visual dominance: Information-processing account of its origins and significance	<i>Psych Rev</i>	1976	10.06
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Treisman, AM; Gelade, G	Feature-integration theory of attention	<i>Cog Psych</i>	1980	106.66
Posner, MI	Orienting of attention	<i>QJEP</i>	1980	80.48
Bower, GH	Mood and memory	<i>Amer Psych</i>	1981	76.68
Zajonc, RB	Feeling and thinking: Preferences need no inferences	<i>Amer Psych</i>	1980	71.97
McClelland, JL; Rumelhart, DE	An interactive activation model of context effects in letter perception: I. An account of basic findings	<i>Psych Rev</i>	1981	63.71
Daneman, M; Carpenter, PA	Individual differences in working memory and reading	<i>JML</i>	1980	52.31
Jacoby, LL; Dallas, M	On the relationship between autobiographical memory and perceptual learning	<i>JEP:Gen</i>	1981	50.50
Kahneman, D; Tversky, A	Choices, values, and frames	<i>Amer Psych</i>	1984	46.84
Mandler, G	Recognizing: The judgment of previous occurrence	<i>Psych Rev</i>	1980	44.93
Chi, MTH; Feltovich, PJ; Glaser, R	Categorization and representation of physics problems by experts and novices	<i>Cog Sci</i>	1981	42.43
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Wimmer, H; Perner, J	Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception	<i>Cog</i>	1983	40.58
Ericsson, KA; Simon, HA	Verbal reports as data	<i>Psych Rev</i>	1980	39.93
Anderson, JR	Acquisition of cognitive skill	<i>Psych Rev</i>	1982	31.07
Gillund, G; Shiffrin, RM	A retrieval model for both recognition and recall	<i>Psych Rev</i>	1984	30.88
Duncan, J	Selective attention and the organization of visual information	<i>JEP:Gen</i>	1984	29.60
Johnson, MK; Raye, CL	Reality monitoring	<i>Psych Rev</i>	1981	25.39
Just, MA; Carpenter, PA	Theory of reading: From eye fixations to comprehension	<i>Psych Rev</i>	1980	24.69
Marcel, AJ	Conscious and unconscious perception: Experiments on visual masking and word recognition	<i>Cog Psych</i>	1983	24.50
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Balota, DA; Chumbley, JJ	Are lexical decisions a good measure of lexical access: The role of word-frequency in the neglected decision stage	<i>JEP:HPP</i>	1984	23.52
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Graf, P; Mandler, G	Activation makes words more accessible, but not necessarily more retrievable	<i>JML</i>	1984	22.56
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Einhorn, HJ; Hogarth, RM	Behavioral decision-theory: Processes of judgment and choice	<i>Ann Rev Psych</i>	1981	20.75
Payne, JW	Contingent decision behavior	<i>Psych Bull</i>	1982	20.48
Jacoby, LL	Remembering the data: Analyzing interactive processes in reading	<i>JML</i>	1983	19.12
Logan, GD; Cowan, WB	On the ability to inhibit thought and action: A theory of an act of control	<i>Psych Rev</i>	1984	19.00
Gick, ML; Holyoak, KJ	Analogical problem-solving	<i>Cog Psych</i>	1980	18.97
Jacoby, LL	Perceptual enhancement: Persistent effects of an experience	<i>JEP:LMC</i>	1983	18.31
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Hoffman, DD; Richards, WA	Parts of recognition	<i>Cog</i>	1984	17.72
Raaijmakers, JGW; Shiffrin, RM	Search of associative memory	<i>Psych Rev</i>	1981	17.71
Fischer, KW	A theory of cognitive-development: The control and construction of hierarchies of skills	<i>Psych Rev</i>	1980	17.38

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Norman, DA	Categorization of action slips	<i>Psych Rev</i>	1981	16.82
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Glaser, R	Education and thinking: The role of knowledge	<i>Amer Psych</i>	1984	16.04
Alba, JW; Hasher, L	Is memory schematic?	<i>Psych Bull</i>	1983	15.88
Murdock, BB	A theory for the storage and retrieval of item and associative information	<i>Psych Rev</i>	1982	15.81
Case, R; Kurland, DM; Goldberg, J	Operational efficiency and the growth of short-term-memory span	<i>J Exp Child Psych</i>	1982	15.81
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Stanovich, KE; Cunningham, AE; Cramer, BB	Assessing phonological awareness in kindergarten-children: Issues of task comparability	<i>J Exp Child Psych</i>	1984	15.00
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Salmoni, AW; Schmidt, RA; Walter, CB.	Knowledge of results and motor learning: A review and critical reappraisal	<i>Psych Bull</i>	1984	14.04
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Biederman, I	Recognition-by-components: A theory of human image understanding	<i>Psych Rev</i>	1987	75.91
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Schacter, DL	Implicit memory: History and current status	<i>JEP:LMC</i>	1987	63.23
Duncan, J; Humphreys, GW	Visual search and stimulus similarity	<i>Psych Rev</i>	1989	60.65
Logan, GD	Toward an instance theory of automatization	<i>Psych Rev</i>	1988	48.43
Wagner, RK; Torgesen, JK	The nature of phonological processing and its causal role in the acquisition of reading skills	<i>Psych Bull</i>	1987	45.73
Stanovich, KE	Matthew effects in reading: Some consequences of individual-differences in the acquisition of literacy	<i>Read Res Quart</i>	1986	45.30
Bruce, V; Young, A	Understanding face recognition	<i>Brit J Psych</i>	1986	43.91
Treisman, A; Gormican, S	Feature analysis in early vision: Evidence from search asymmetries	<i>Psych Rev</i>	1988	43.67
Dell, GS	A spreading-activation theory of retrieval in sentence production	<i>Psych Rev</i>	1986	41.22
Kintsch, W	The role of knowledge in discourse comprehension: A construction integration model	<i>Psych Rev</i>	1988	41.05
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Nosofsky, RM	Attention, similarity, and the identification–categorization relationship	<i>JEP:Gen</i>	1986	34.78
Kahneman, D; Miller, DT	Norm theory: Comparing reality to its alternatives	<i>Psych Rev</i>	1986	34.57
Murphy, GL; Medin, DL	The role of theories in conceptual coherence	<i>Psych Rev</i>	1985	34.33
Blaney, PH	Affect and memory: A review	<i>Psych Bull</i>	1986	32.61
Richardson-Klavehn, A; Bjork, RA	Measures of memory	<i>Ann Rev Psych</i>	1988	32.33
Tipper, SP	The negative priming effect: Inhibitory priming by ignored objects	<i>QJEP</i>	1985	31.83
Hintzman, DL	Schema abstraction in a multiple-trace memory model	<i>Psych Rev</i>	1986	31.70

Fodor, JA; Pylyshyn, ZW	Connectionism and cognitive architecture: A critical analysis	<i>Cog</i>	1988	29.48
Liberman, AM; Mattingly, IG	The motor theory of speech perception revised	<i>Cog</i>	1985	29.04
Reber, AS	Implicit learning and tacit knowledge	<i>JEP:Gen</i>	1989	27.80
McClelland, JL; Elman, JL	The trace model of speech perception	<i>Cog Psych</i>	1986	27.70
Eriksen, CW; Stjames, JD	Visual-attention within and around the field of focal attention: A zoom lens model	<i>Perc & Psychophys</i>	1986	26.96
Tversky, A; Sattath, S; Slovic, P	Contingent weighting in judgment and choice	<i>Psych Rev</i>	1988	26.86
Diamond, R; Carey, S	Why faces are and are not special: An effect of expertise	<i>JEP:Gen</i>	1986	26.83
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Blaxton, TA	Investigating dissociations among memory measures: Support for a transfer-appropriate processing framework	<i>JEP:LMC</i>	1989	24.55
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Smolensky, P	On the proper treatment of connectionism	<i>BBS</i>	1988	23.43
Holender, D	Semantic activation without conscious identification in dichotic listening, parafoveal vision, and visual masking: A survey and appraisal	<i>BBS</i>	1986	22.00
Gardiner, JM	Functional aspects of recollective experience	<i>Mem & Cog</i>	1988	22.00
Hastie, R; Park, B	The relationship between memory and judgment depends on whether the judgment task is memory-based or online	<i>Psych Rev</i>	1986	21.43
Eriksen, CW; Yeh, YY	Allocation of attention in the visual field	<i>JEP:HPP</i>	1985	20.63
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Cheng, PW; Holyoak, KJ	Pragmatic reasoning schemas	<i>Cog Psych</i>	1985	20.04
Turner, ML; Engle, RW	Is working memory capacity task dependent	<i>JML</i>	1989	20.00
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Sweller, J	Cognitive load during problem-solving: Effects on learning	<i>Cog Sci</i>	1988	18.57
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Cerella, J	Information-processing rates in the elderly	<i>Psych Bull</i>	1985	18.04
Grossberg, S; Mingolla, E	Neural dynamics of form perception: Boundary completion, illusory figures, and neon color spreading	<i>Psych Rev</i>	1985	18.04
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Johnson, MK; Hashtroudi, S; Lindsay, DS	Source monitoring	<i>Psych Bull</i>	1993	79.75
Jacoby, LL	A process dissociation framework: Separating automatic from intentional uses of memory	<i>JML</i>	1991	77.11
Macleod, CM	Half a century of research on the Stroop effect: An integrative review	<i>Psych Bull</i>	1991	74.78

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Wolfe, JM	Guided search 2.0: A revised model of visual-search	<i>PB&R</i>	1994	60.27
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Light, LL	Memory and aging: Four hypotheses in search of data	<i>Ann Rev Psych</i>	1991	22.00
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Lindenberger, U; Baltes, PB	Sensory functioning and intelligence in old-age: A strong connection	<i>Psych & Aging</i>	1994	18.00
Kramer, AF; Humphrey, DG; Larish, JF; Logan, GD; Strayer, DL	Aging and inhibition: Beyond a unitary view of inhibitory processing in attention	<i>Psych & Aging</i>	1994	17.80
Hasher, L; Stolzhus, ER; Zacks, RT; Rypma, B	Age and inhibition	<i>JEP:LMC</i>	1991	17.78
Eysenck, MW; Calvo, MG	Anxiety and performance: The processing efficiency theory	<i>Cog & Emot</i>	1992	17.76
Hulme, C; Maughan, S; Brown, GDA	Memory for familiar and unfamiliar words: Evidence for a long-term memory contribution to short-term memory span	<i>JML</i>	1991	17.56
Cave, KR; Wolfe, JM	Modeling the role of parallel processing in visual search	<i>Cog Psych</i>	1990	17.37
Yonelinas, AP	Receiver-operating characteristics in recognition memory: Evidence for a dual-process model	<i>JEP:LMC</i>	1994	17.33
O'Regan, JK	Solving the real mysteries of visual-perception: The world as an outside memory	<i>Can J Exp Psych</i>	1992	17.29
Schmidt, RA; Bjork, RA	New conceptualizations of practice: Common principles in three paradigms suggest new concepts for training	<i>Psych Sci</i>	1992	17.24
Kroll, JF; Stewart, E	Category interference in translation and picture naming: Evidence for asymmetric connections between bilingual memory representations	<i>JML</i>	1994	17.20
Fischer, B; Weber, H	Express saccades and visual attention	<i>BBS</i>	1993	17.06
Cohen, A; Ivry, RI; Keele, SW	Attention and structure in sequence learning	<i>JEP:LMC</i>	1990	16.84
Bacon, WF; Egeth, HE	Overriding stimulus-driven attentional capture	<i>Perc & Psychophys</i>	1994	16.20
Theeuwes, J	Perceptual selectivity for color and form	<i>Perc & Psychophys</i>	1992	16.00
King, J; Just, MA	Individual differences in syntactic processing: The role of working memory	<i>JML</i>	1991	15.94
Griffin, D; Tversky, A	The weighing of evidence and the determinants of confidence	<i>Cog Psych</i>	1992	15.88
Gerstadt, CL; Hong, YJ; Diamond, A	The relationship between cognition and action: Performance of children 3 1/2–7 years old on a Stroop-like day–night test	<i>Cog</i>	1994	15.40
1995–1999				
Levelt, WJM; Roelofs, A; Meyer, AS	A theory of lexical access in speech production	<i>BBS</i>	1999	79.80
Salthouse, TA	The processing-speed theory of adult age differences in cognition	<i>Psych Rev</i>	1996	76.08
Roediger, HL; McDermott, KB	Creating false memories: Remembering words not presented in lists	<i>JEP:LMC</i>	1995	60.64
Rayner, K	Eye movements in reading and information processing: 20 years of research	<i>Psych Bull</i>	1998	60.45
Barsalou, LW	Perceptual symbol systems	<i>BBS</i>	1999	56.60
Plaut, DC; McClelland, JL; Seidenberg, MS; Patterson, K	Understanding normal and impaired word reading: Computational principles in quasi-regular domains	<i>Psych Rev</i>	1996	56.54
Bargh, JA; Chartrand, TL	The unbearable automaticity of being	<i>Amer Psych</i>	1999	53.60
Rogers, RD; Monsell, S	Costs of a predictable switch between simple cognitive tasks	<i>JEP:Gen</i>	1995	53.14
Rensink, RA; O'Regan, JK; Clark, JJ	To see or not to see: The need for attention to perceive changes in scenes	<i>Psych Sci</i>	1997	44.33
Engle, RW; Tuholski, SW; Laughlin, JE; Conway, ARA	Working memory, short-term memory, and general fluid intelligence: A latent-variable approach	<i>JEP:Gen</i>	1999	42.60
Ericsson, KA; Kintsch, W	Long-term working memory	<i>Psych Rev</i>	1995	38.93
Landauer, TK; Foltz, PW; Laham, D	An introduction to latent semantic analysis	<i>Disc Process</i>	1998	38.82
Baddeley, A; Gathercole, S; Papagno, C	The phonological loop as a language learning device	<i>Psych Rev</i>	1998	35.55
Sloman, SA	The empirical case for two systems of reasoning	<i>Psych Bull</i>	1996	33.38
Farah, MJ; Wilson, KD; Drain, M; Tanaka, JN	What is "special" about face perception?	<i>Psych Rev</i>	1998	27.64
Zwaan, RA; Radvansky, GA	Situation models in language comprehension and memory	<i>Psych Bull</i>	1998	27.45
Chun, MM; Potter, MC	A two-stage model for multiple-target detection in rapid serial visual presentation	<i>JEP:HPP</i>	1995	27.14

Meiran, N	Reconfiguration of processing mode prior to task performance	<i>JEP:LMC</i>	1996	27.08
Simons, DJ; Levin, DT	Change blindness	<i>Trends Cog Sci</i>	1997	26.83
Gigerenzer, G; Goldstein, DG	Reasoning the fast and frugal way: Models of bounded rationality	<i>Psych Rev</i>	1996	26.08
Share, DL	Phonological recoding and self-teaching: Sine qua non of reading acquisition	<i>Cog</i>	1995	25.93
Gibson, E	Linguistic complexity: Locality of syntactic dependencies	<i>Cog</i>	1998	25.45
Meyer, DE; Kieras, DE	A computational theory of executive cognitive processes and multiple-task performance: I. Basic mechanisms	<i>Psych Rev</i>	1997	25.33
Lavie, N	Perceptual load as a necessary condition for selective attention	<i>JEP:HPP</i>	1995	25.21
Gigerenzer, G; Hoffrage, U	How to improve Bayesian reasoning without instruction: Frequency formats	<i>Psych Rev</i>	1995	23.43
Hoffman, JE; Subramaniam, B	The role of visual-attention in saccadic eye movements	<i>Perc & Psychophys</i>	1995	23.36
Findlay, JM; Walker, R	A model of saccade generation based on parallel processing and competitive inhibition	<i>BBS</i>	1999	22.70
Ericsson, KA; Lehmann, AC	Expert and exceptional performance: evidence of maximal adaptation to task constraints	<i>Ann Rev Psych</i>	1996	22.38
Reichle, ED; Pollatsek, A; Fisher, DL; Rayner, K	Toward a model of eye movement control in reading	<i>Psych Rev</i>	1998	22.09
Glenberg, AM	What memory is for	<i>BBS</i>	1997	21.92
Egeth, HE; Yantis, S	Visual attention: Control, representation, and time course	<i>Ann Rev Psych</i>	1997	21.83
Burgess, N; Hitch, GJ	Memory for serial order: A network model of the phonological loop and its timing	<i>Psych Rev</i>	1999	21.60
Gentner, D; Markman, AB	Structure mapping in analogy and similarity	<i>Amer Psych</i>	1997	20.83
Daneman, M; Merikle, PM	Working memory and language comprehension: A meta-analysis	<i>PB&R</i>	1996	20.77
Caplan, D; Waters, GS	Verbal working memory and sentence comprehension	<i>BBS</i>	1999	19.90
Frost, R	Toward a strong phonological theory of visual word recognition: True issues and false trails	<i>Psych Bull</i>	1998	19.55
Donaldson, W	The role of decision processes in remembering and knowing	<i>Mem & Cog</i>	1996	19.54
Driver, J; Davis, G; Ricciardelli, P; Kidd, P; Maxwell, E; Baron-Cohen, S	Gaze perception triggers reflexive visuospatial orienting	<i>Vis Cog</i>	1999	19.20
Leopold, DA; Logothetis, NK	Multistable phenomena: Changing views in perception	<i>Trends Cog Sci</i>	1999	18.70
Craik, FIM; Govoni, R; Naveh-Benjamin, M; Anderson, ND	The effects of divided attention on encoding and retrieval processes in human memory	<i>JEP:Gen</i>	1996	18.69
Schacter, DL; Israel, L; Racine, C	Suppressing false recognition in younger and older adults: The distinctiveness heuristic	<i>JML</i>	1999	18.60
Mody, M; Studdertkenedy, M; Brady, S	Speech perception deficits in poor readers: auditory processing or phonological coding?	<i>J Exp Child Psych</i>	1997	18.42
Shiffrin, RM; Steyvers, M	Model for recognition memory: REM—retrieving effectively from memory	<i>PB&R</i>	1997	18.25
Hummel, JE; Holyoak, KJ	Distributed representations of structure: A theory of analogical access and mapping	<i>Psych Rev</i>	1997	18.17
May, CP; Kane, MJ; Hasher, L	Determinants of negative priming	<i>Psych Bull</i>	1995	18.14
Fox, E	Negative priming from ignored distractors in visual selection: A review	<i>PB&R</i>	1995	18.14
Payne, DG; Elie, CJ; Blackwell, JM; Neuschatz, JS	Memory illusions: recalling, recognizing, and recollecting events that never occurred	<i>JML</i>	1996	17.85
Norman, KA; Schacter, DL	False recognition in younger and older adults: Exploring the characteristics of illusory memories	<i>Mem & Cog</i>	1997	17.83
Goldstone, RL	Perceptual learning	<i>Ann Rev Psych</i>	1998	17.82
Lu, CH; Proctor, RW	The influence of irrelevant location information on performance: A review of the Simon and spatial Stroop effects	<i>PB&R</i>	1995	17.79
Kahneman, D; Tversky, A	On the reality of cognitive illusions	<i>Psych Rev</i>	1996	17.69
Spieler, DH; Balota, DA; Faust, ME	Stroop performance in healthy younger and older adults and in individuals with dementia of the Alzheimer's type	<i>JEP:HPP</i>	1996	17.62
Henderson, JM; Hollingworth, A	High-level scene perception	<i>Ann Rev Psych</i>	1999	17.30
Simons, DJ; Levin, DT	Failure to detect changes to people during a real-world interaction	<i>PB&R</i>	1998	17.27

Gilchrist, A; Kossyfidis, C; Bonato, F; Agostini, T; Cataliotti, J; Li, XJ; Spehar, B; Annan, V; Economou, E Cosmides, L; Tooby, J	An anchoring theory of lightness perception Are humans good intuitive statisticians after all? Rethinking some conclusions from the literature on judgment under uncertainty	<i>Psych Rev</i> <i>Cog</i>	1999 1996	16.80 16.77
Nosofsky, RM; Palmeri, TJ	An exemplar-based random walk model of speeded classification	<i>Psych Rev</i>	1997	16.75
Simons, DJ; Chabris, CF	Gorillas in our midst: sustained inattentional blindness for dynamic events	<i>Perc</i>	1999	16.60
McRae, K; Desa, VR; Seidenberg, MS	On the nature and scope of featural representations of word meaning	<i>JEP:Gen</i>	1997	16.58
Anderson, MC; Spellman, BA	On the status of inhibitory mechanisms in cognition: Memory retrieval as a model case	<i>Psych Rev</i>	1995	16.50
Verhaeghen, P; Salthouse, TA	Meta-analyses of age-cognition relations in adult- hood: Estimates of linear and nonlinear age effects and structural models	<i>Psych Bull</i>	1997	16.50
Klein, RM; MacInnes, WJ	Inhibition of return is a foraging facilitator in visual search	<i>Psych Sci</i>	1999	16.40
Goldinger, SD	Echoes of echoes? An episodic theory of lexical access	<i>Psych Rev</i>	1998	16.36
Treiman, R; Mullennix, J; Bijeljac-Babic, R; Richmond- welly, ED	The special role of rimes in the description, use, and acquisition of English orthography	<i>JEP:Gen</i>	1995	16.29
Ratcliff, R; Van Zandt, T; McKoon, G	Connectionist and diffusion models of reaction time	<i>Psych Rev</i>	1999	16.00
2000–2004				
Coltheart, M; Rastle, K; Perry, C; Langdon, R; Ziegler, J Yonelinas, AP	DRC: A dual route cascaded model of visual word recognition and reading aloud The nature of recollection and familiarity: A review of 30 years of research	<i>Psych Rev</i> <i>JML</i>	2001 2002	72.75 70.86
Cowan, N	The magical number 4 in short-term memory: A reconsideration of mental storage capacity	<i>BBS</i>	2001	61.38
Baddeley, A	The episodic buffer: A new component of working memory?	<i>Trends Cog Sci</i>	2000	60.67
Conway, MA; Pleydell-Pearce, CW	The construction of autobiographical memories in the self-memory system	<i>Psych Rev</i>	2000	48.33
Kahneman, D	A perspective on judgment and choice: Mapping bounded rationality	<i>Amer Psych</i>	2003	42.17
Klein, RM	Inhibition of return	<i>Trends Cog Sci</i>	2000	41.89
Monsell, S	Task switching	<i>Trends Cog Sci</i>	2003	40.00
Hommel, B; Musseler, J; Aschersleben, G; Prinz, W	The theory of event coding (TEC): A framework for perception and action planning	<i>BBS</i>	2001	39.50
Rensink, RA	Change detection	<i>Ann Rev Psych</i>	2002	30.86
Anderson, JR; Bothell, D; Byrne, MD; Douglass, S; Lebiere, C; Qin, YL	An integrated theory of the mind	<i>Psych Rev</i>	2004	29.80
O'Regan, JK; Noe, A	A sensorimotor account of vision and visual consciousness	<i>BBS</i>	2001	29.75
Stanovich, KE; West, RF	Individual differences in reasoning: Implications for the rationality debate?	<i>BBS</i>	2000	28.67
Glenberg, AM; Kaschak, MP	Grounding language in action	<i>PB&R</i>	2002	25.86
Kane, MJ; Engle, RW	Working-memory capacity and the control of attention: The contributions of goal neglect, response competition, and task set to Stroop interference	<i>JEP:Gen</i>	2003	25.67
Kane, MJ; Hambrick, DZ; Tuholski, SW; Wilhelm, O; Payne, TW; Engle, RW	The generality of working memory capacity: A latent- variable approach to verbal and visuospatial mem- ory span and reasoning	<i>JEP:Gen</i>	2004	25.60
Rubinstein, JS; Meyer, DE; Evans, JE	Executive control of cognitive processes in task switching	<i>JEP:HPP</i>	2001	25.00
Usher, M; McClelland, JL	The time course of perceptual choice: The leaky, competing accumulator model	<i>Psych Rev</i>	2001	24.50
Engle, RW	Working memory capacity as executive attention	<i>Curr Dir Psych Sci</i>	2002	24.43
Scholl, BJ	Objects and attention: The state of the art	<i>Cog</i>	2001	22.50
Di Lollo, V; Enns, JT; Rensink, RA	Competition for consciousness among visual events: The psychophysics of reentrant visual processes	<i>JEP:Gen</i>	2000	22.22

Friedman, NP; Miyake, A	The relations among inhibition and interference control functions: A latent-variable analysis	<i>JEP:Gen</i>	2004	22.00
Tipper, SP	Does negative priming reflect inhibitory mechanisms? A review and integration of conflicting views	<i>QJEP</i>	2001	21.63
Brown, GDA; Preece, T; Hulme, C	Oscillator-based memory for serial order	<i>Psych Rev</i>	2000	21.56
Awh, E; Jonides, J	Overlapping mechanisms of attention and spatial working memory	<i>Trends Cog Sci</i>	2001	21.25
Seymour, PHK; Aro, M; Erskine, JM; Wimmer, H; Leybaert, J; Elbro, C; Lyytinen, H; Gombert, JE; Le Normand, MT; Schneider, W; Porpodas, C; Ragnarsdottir, H; Tressoldi, P; Vio, C; De Groot, A; Licht, R; Iannessen, FE; Castro, SL; Cary, L; Defior, S; Martos, F; Olofsson, A	Foundation literacy acquisition in European orthographies	<i>Brit J Psych</i>	2003	21.17
Waszak, F; Hommel, B; Allport, A	Task-switching and long-term priming: Role of episodic stimulus–task bindings in task-shift costs	<i>Cog Psych</i>	2003	21.17
Mayr, U; Keele, SW	Changing internal constraints on action: The role of backward inhibition	<i>JEP:Gen</i>	2000	21.11
Vogel, EK; Woodman, GF; Luck, SJ	Storage of features, conjunctions, and objects in visual working memory	<i>JEP:HPP</i>	2001	20.13
Meiran, N; Chorev, Z; Sapir, A	Component processes in task switching	<i>Cog Psych</i>	2000	20.00
Kersten, D; Mamassian, P; Yuille, A	Object perception as Bayesian inference	<i>Ann Rev Psych</i>	2004	20.00
Pickering, MJ; Garrod, S	Toward a mechanistic psychology of dialogue	<i>BBS</i>	2004	20.00
Castles, A; Coltheart, M	Is there a causal link from phonological awareness to success in learning to read?	<i>Cog</i>	2004	19.80
Lavie, N; Hirst, A; de Fockert, JW; Viding, E	Load theory of selective attention and cognitive control	<i>JEP:Gen</i>	2004	19.80
Indefrey, P; Levelt, WJM	The spatial and temporal signatures of word production components	<i>Cog</i>	2004	19.80
Barsalou, LW; Simmons, WK; Barbey, AK; Wilson, CD.	Grounding conceptual knowledge in modality-specific systems	<i>Trends Cog Sci</i>	2003	19.67
Simons, DJ	Current approaches to change blindness	<i>Vis Cog</i>	2000	19.44
Nelson, KD; Fivush, R	The emergence of autobiographical memory: A social cultural developmental theory	<i>Psych Rev</i>	2004	19.40
Kane, MJ; Bleckley, MK; Conway, ARA; Engle, RW	A controlled-attention view of working-memory capacity	<i>JEP:Gen</i>	2001	19.00
Logan, GD; Gordon, RD	Executive control of visual attention in dual-task situations	<i>Psych Rev</i>	2001	18.75
Ernst, MO; Bulthoff, HH	Merging the senses into a robust percept	<i>Trends Cog Sci</i>	2004	18.60
Alvarez, GA; Cavanagh, P	The capacity of visual short-term memory is set both by visual information load and by number of objects	<i>Psych Sci</i>	2004	18.40
Reichle, ED; Rayner, K; Pollatsek, A	The E-Z Reader model of eye-movement control in reading: Comparisons to other models	<i>BBS</i>	2003	18.17
Leder, H; Bruce, V	When inverted faces are recognized: The role of configural information in face recognition	<i>QJEP</i>	2000	18.00
Logan, GD; Bundesen, C	Clever homunculus: Is there an endogenous act of control in the explicit task-cuing procedure?	<i>JEP:HPP</i>	2003	18.00
Harm, MW; Seidenberg, MS	Computing the meanings of words in reading: Cooperative division of labor between visual and phonological processes	<i>Psych Rev</i>	2004	18.00
Park, DC; Lautenschlager, G; Hedden, T; Davidson, NS; Smith, AD; Smith, PK	Models of visuospatial and verbal memory across the adult life span	<i>Psych & Aging</i>	2002	17.43
Ratcliff, R; Smith, PL	A comparison of sequential sampling models for two-choice reaction time	<i>Psych Rev</i>	2004	17.40
Conway, ARA; Cowan, N; Bunting, MF; Theriault, DJ; Minkoff, SRB	A latent variable analysis of working memory capacity, short-term memory capacity, processing speed, and general fluid intelligence	<i>Int</i>	2002	17.14
Ehri, LC; Nunes, SR; Willows, DM; Schuster, BV; Yaghoub-Zadeh, Z; Shanahan, T	Phonemic awareness instruction helps children learn to read: Evidence from the national reading panel's meta-analysis	<i>Read Res Quart</i>	2001	17.13

Enns, JT; Di Lollo, V	What's new in visual masking?	<i>Trends Cog Sci</i>	2000	17.11
Ahissar, M; Hochstein, S	The reverse hierarchy theory of visual perceptual learning	<i>Trends Cog Sci</i>	2004	16.80
Johnson-Laird, PN; Byrne, RMJ	Conditionals: A theory of meaning, pragmatics, and inference	<i>Psych Rev</i>	2002	16.57
Franz, VH; Gegenfurtner, KR; Bulthoff, HH; Fahle, M	Grasping visual illusions: No evidence for a dissociation between perception and action	<i>Psych Sci</i>	2000	16.56
Spence, C; Shore, DI; Klein, RM	Multisensory prior entry	<i>JEP:Gen</i>	2001	16.38
Miyake, A; Friedman, NP; Rettinger, DA; Shah, P; Hegarty, M	How are visuospatial working memory, executive functioning, and spatial abilities related? A latent-variable analysis	<i>JEP:Gen</i>	2001	16.25
Wylie, G; Allport, A	Task switching and the measurement of switch costs	<i>Psych Res</i>	2000	16.22
Grush, R	The emulation theory of representation: Motor control, imagery, and perception	<i>BBS</i>	2004	16.20
Norris, D; McQueen, JM; Cutler, A	Merging information in speech recognition: Feedback is never necessary	<i>BBS</i>	2000	16.11
Roediger, HL; Watson, JM; McDermott, KB; Gallo, DA	Factors that determine false recall: A multiple regression analysis	<i>PB&R</i>	2001	16.00
Anderson, MC	Rethinking interference theory: Executive control and the mechanisms of forgetting	<i>JML</i>	2003	16.00
Intriligator, J; Cavanagh, P	The spatial resolution of visual attention	<i>Cog Psych</i>	2001	15.75
Schuch, S; Koch, I	The role of response selection for inhibition of task sets in task shifting	<i>JEP:HPP</i>	2003	15.67
Newport, EL; Aslin, RN	Learning at a distance: I. Statistical learning of non-adjacent dependencies	<i>Cog Psych</i>	2004	15.60
Evans, JST	In two minds: dual-process accounts of reasoning	<i>Trends Cog Sci</i>	2003	15.50
Nosek, BA; Banaji, MR	The go/no-go association task	<i>Soc Cog</i>	2001	15.25
Mondloch, CJ; Le Grand, R; Maurer, D	Configural face processing develops more slowly than featural face processing	<i>Perc</i>	2002	15.00
Zevin, JD; Seidenberg, MS	Age of acquisition effects in word reading and other tasks	<i>JML</i>	2002	14.86
Salthouse, TA; Atkinson, TM; Berish, DE	Executive functioning as a potential mediator of age-related cognitive decline in normal adults.	<i>JEP:Gen</i>	2003	14.83

^a The legend for the journal abbreviations can be found in Table 1.

Appendix B

Procedure for our supplemental search using Harzing's Publish or Perish

We supplemented our database by conducting additional searches using Harzing's Publish or Perish (HPOP) software to find additional articles that would qualify for entry on our top-500 list. Because it would be impractical to do searches for all cognitive psychologists, we restricted our search to the 78 authors whose articles are included in our Table 3. We typed the name of each author into the "Author impact" tab and proceeded to select any article, book, or book chapter whose mean cites per year exceeded by at least 20 % the value for the article with the lowest number of mean cites per year in that article, book, or chapter's corresponding era bin (see the last column of Table 2). Because we did not have data for all available issues of the 56 journals that we surveyed through WoS—usually the earlier issues were the ones not included—we also conducted searches by journal using the "Journal impact" tab to find any highly cited articles that appeared in these

missing issues. We also conducted such a search for the two journals (*Journal of Research in Reading and Thinking & Reasoning*) that we had omitted because there were only 2 years of data for each of them. Articles that did not meet our selection criteria, stated in the "Method" section, were excluded. To save space, we present below only the results from the additional journal searches.

Because the mean-cites-per-year data from HPOP were almost always greater than those obtained from WoS, whenever possible, we returned to WoS to compute the mean-cites-per-year data for journal articles. (We were able to obtain WoS data for almost all of the additional articles.) For the books, book chapters, and articles for which WoS data were not available, the mean-cites-per-year and total-citations data are based on those provided by HPOP at the time that the searches were made (between January 5 and 15, 2012). A potential limitation of the supplemental data for uncovering publications that would have made our top-500 list is that we limited our search to the 78 authors who had three or more publications in our top-500 list. However, we believe that this is not a major limitation, because these eminent authors are the most likely to have other highly

cited publications that we might have missed in our WoS search.

Author(s)	Title	Journal ^a	Year	Cites/Year	Total Citations
Baddeley, AD; Hitch, GJL	Working memory	<i>Psych Learn & Motiv</i>	1974	145.76	5,101
Atkinson, RC; Shiffrin, RM	Human memory: A proposed system and its control processes	<i>Psych Learn & Motiv</i>	1968	99.07	4,062
Hasher, L; Zachs, RT	Working memory, comprehension, and aging: A review and a new view	<i>Psych Learn & Motiv</i>	1988	72.46	1,522
Sweller, J	Cognitive load theory, learning difficulty, and instructional design	<i>Learn & Instr</i>	1994	47.22	708
Oatley, J; Johnson-Laird, PN	Towards a cognitive theory of emotions	<i>Cog & Emot</i>	1987	40.8	898
Nelson, TO; Narens, L	Metamemory: A theoretical framework and new findings	<i>Psych Learn & Motiv</i>	1990	30.09	572
Ehri, LC	Phases of development in learning to read words by sight	<i>J Res Reading</i>	1995	26.83	376
Garrett, MF	The analysis of sentence production	<i>Psych Learn & Motiv</i>	1975	21.3	724
Leventhal, H; Scherer, KR	The relationship of emotion to cognition: A functional approach to a semantic controversy	<i>Cog & Emot</i>	1987	21	462
Mandler, G	Organization and memory	<i>Psych Learn & Motiv</i>	1967	15.2	638
Bousfield, W	The occurrence of clustering in the recall of randomly arranged associates	<i>J Gen Psych</i>	1953	13.95	781
Dyer, FN	The Stroop phenomenon and its use in the study of perceptual, cognitive, and response processes	<i>Mem & Cog</i>	1973	10.44	375
Bower, GH	A multicomponent theory of the memory trace	<i>Psych Learn & Motiv</i>	1967	9.02	378

^a *J Res Reading* = *Journal of Research in Reading*; *Learn & Instr* = *Learning & Instruction*; for all other journal abbreviations, see Table 1.

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