Intelligence 37 (2009) 443–446

Contents lists available at ScienceDirect

Intelligence

Editorial

The impact of papers published in *Intelligence* 1977–2007 and an overview of the citation classics ☆

Jelte M. Wicherts *

Department of Psychology, Psychological Methods, University of Amsterdam, Roetersstraat 15, 1018 WB Amsterdam, The Netherlands

ARTICLE INFO

Article history:
Received 26 June 2009
Accepted 29 June 2009
Available online 25 July 2009

Keywords:
Scientometrics
Citation analysis
Scientific impact

ABSTRACT

This editorial discusses the impact of the journal of *Intelligence* between 1977 and 2007. The impact factor of *Intelligence* has been increasing over the past decade, and currently stands at 3.27. This relatively high impact factor reflects the influence of the journal in the science of individual differences in cognitive abilities. Typical articles published in *Intelligence* are cited between four and ten times. The 25 most cited papers in *Intelligence* are described. The work published in *Intelligence* is widely cited and reflects nicely the multi-disciplinary nature of the field.

In 1977, Douglas K. Detterman founded the journal *Intelligence* because the topic of intelligence received (and continues to receive) wide interest, but "there was not a single journal devoted exclusively to the publication of basic research [on intelligence]" (1977, p. 2). Between 1977 and 2007 *Intelligence* has published 797 regular articles, 45 book reviews, 74 comments, 67 editorials, and 7 obituaries.[1] According to Web of Science, as of June 23, 2009, these publications have garnered a total of 16,464 citations in journal publications in the ISI database. In an informal count, we may add to this number the great many additional publications, and an additional 800 citations within Web of Science that were somehow incorrect. For instance, Ian J. Deary is *not* called "Ian J. Dreary", as one group of researchers would have it. Also, in no less than 23 of the 111 instances, the page numbers of Phil Ackerman's (1996) article on the link between personality, interests, and knowledge were incorrect (please check your files, it is not 229–257, but rather 227–257). Supposedly because incorrect cites suggest that the original work was not read by the citing party, these cites are not taken into account by ISI Thompson in computing the yearly impact factor of scientific journals. Although not without its critics (e.g., Brumback, 2008) the impact factor is widely viewed as an indicator of a journal's scientific impact. A journal's impact factor for a given year is equal to the number of cites in that year to articles published in the journal in the two previous years, divided by the number of articles published in the two previous years. The impact factor's denominator does not take into account commentaries, book reviews, corrections, and editorials. Thus, my referring in this editorial to myself and my coworkers (Molenaar, Dolan, & Wicherts, 2009) is sort of cheating.

As can be seen in Fig. 1, the impact factor of *Intelligence* has shown a marked increase in the last 12 years. Its 2008 impact factor is 3.27, which suggests that, on average, a paper published in *Intelligence* is cited more than three times within the two years after publication. *Intelligence* ranks among the Top 15 of over a hundred journals devoted to multidisciplinary psychology in the ISI database. *Intelligence* is just one place behind *Behavior Genetics*, but the difference is small (3.27 vs. 3.29). With two additional cites, or two less incorrect cites (remember: Deary, not *Dreary*!), *Intelligence* would have outscored *Behavior Genetics*. Given its high impact factor, *Intelligence* would have been in the top five, were it included in several other categories in the ISI database, such as Educational Psychology (3rd), Social Psychology (4th), or Applied Psychology (3rd). *Intelligence* is among the most widely cited journals devoted to individual differences.

☆ The preparation of this article was supported by VENI grant no. 451-07-016 from the Netherlands Organization for Scientific Research (NWO).

* Tel.: +31 205257067; fax: +31 206390026.
E-mail address: J.M.Wicherts@uva.nl.

[1] The full list of all publications, including citation scores, is available on *Sciencedirect* as a supplementary data file.

0160-2896/$ – see front matter © 2009 Elsevier Inc. All rights reserved.
doi:10.1016/j.intell.2009.06.004

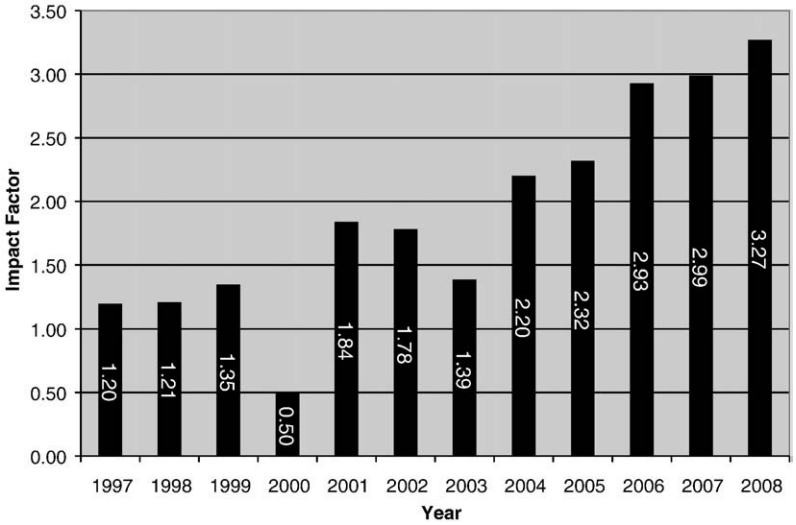

Fig. 1. Impact factor trend of *Intelligence* 1997–2008.

Obviously, citing a paper is not tantamount to subscribing to its conclusions. Among the most widely cited *Intelligence* papers of 2006 and 2007 are two papers on national IQ (Lynn & Mikk, 2007; Templer & Arikawa, 2006) that we have criticized in our own work (Wicherts, Borsboom, & Dolan, in press; Wicherts, Dolan, & van der Maas, in press). Nonetheless, papers that are cited often are by definition worthy of attention, and they often do inspire new research. In science, there is nothing worse than being ignored!

It is often said that most papers published in science are never cited. Not so for papers that have appeared in *Intelligence*. Of the 797 regular articles published in *Intelligence* between 1977 and 2007, only 25 (3.1%) have not been cited. However, 40% of these un-cited articles are fairly recent. It is to be expected that many of these recent papers (e.g., Kröner & Biermann, 2007; Reeve & Lam, 2007) will eventually be cited. Of the articles published before 2006, 98% have been cited at least once, but typically more often. The median number of citations is 10 and the mode equals 4. The distribution of citations for articles is given in Fig. 2. The message is clear: If you want your intelligence work to be read, *Intelligence* is a good outlet.

It is interesting to consider the papers that have received most citations over the years. The top twenty-five of highly cited *Intelligence* papers is given in Table 1.These include: articles on the predictive effects of working memory (Cantor, Engle, & Hamilton, 1991; Conway, Cowan, Bunting, Therriault, & Minkoff, 2002; Kyllonen & Christal, 1990; Süß, Oberauer, Wittmann, Wilhelm, & Schulze, 2002), a theoretical paper on the

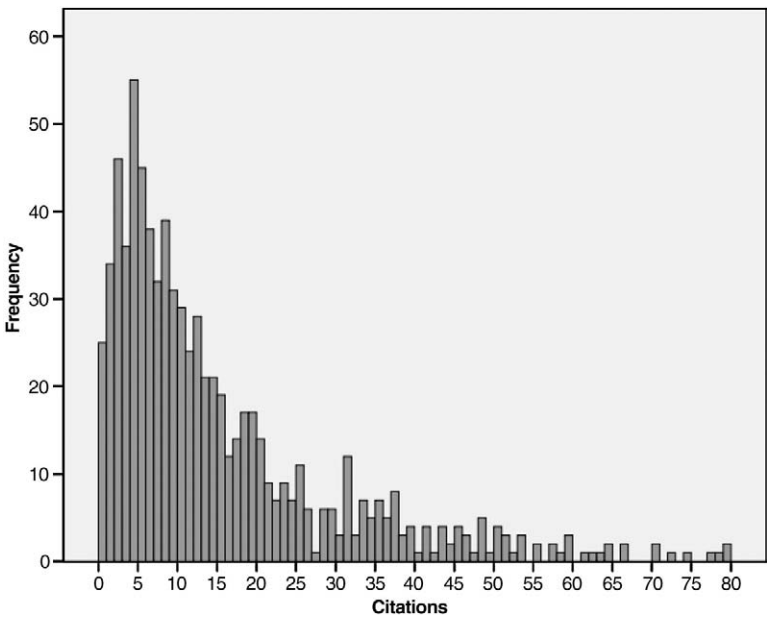

Fig. 2. Distribution of citation count for articles published in *Intelligence* 1977–2007.

Table 1
Top 25 of most widely cited papers published in Intelligence (1977–2007).

Rank	Citations	Authors	Title
1	492	Kyllonen and Christal (1990)	Reasoning ability is (little more than) working-memory capacity?!
2	224	Gustafsson (1984)	A unifying model for the structure of intellectual abilities.
3	221	Mayer et al. (1999)	Emotional intelligence meets traditional standards for an intelligence.
4	198	Haier et al. (1988)	Cortical glucose metabolic-rate correlates of abstract reasoning and attention studied with PET.
5	189	Gottfredson (1997)	Why *g* matters: The complexity of everyday life.
6	186	Vernon (1983)	Speed of information-processing and general intelligence.
7	174	Jensen and Munro (1979)	Reaction time, movement time, and intelligence.
8	158	Willerman et al. (1991)	In vivo brain size and intelligence.
9	153	Kranzler and Jensen (1989)	Inspection time and intelligence — A meta-analysis.
10	135	Mayer and Salovey (1993)	The intelligence of emotional intelligence.
11	134	Conway et al. (2002)	A latent variable analysis of working memory capacity, short-term memory capacity, processing speed, and general fluid intelligence.
12	131	Fagan and McGrath (1981)	Infant recognition memory and later intelligence.
13	116	Haier et al. (1992)	Intelligence and changes in regional cerebral glucose metabolic-rate following learning.
14	115	Detterman and Daniel (1989)	Correlations of mental tests with each other and with cognitive variables are highest for low IQ groups.
15	110	Marshalek et al. (1983)	The complexity continuum in the radex and hierarchical-models of intelligence.
16	110	Jensen and Weng (1994)	What is good g?
17	109	Deary et al. (2000)	The stability of individual differences in mental ability from childhood to old age: Follow-up of the 1932 Scottish mental survey.
18	97	Plomin and Defries (1980)	Genetics and intelligence — Recent data.
19	89	Dempster (1991)	Inhibitory processes — A neglected dimension of intelligence.
20	88	Süß et al. (2002)	Working-memory capacity explains reasoning ability — and a little bit more.
21	88	Ackerman (1996)	A theory of adult intellectual development: Process, personality, interests, and knowledge.
22	85	Humphreys (1979)	The construct of general intelligence.
23	84	Cantor et al. (1991)	Short-term memory, working memory, and verbal abilities— How do they relate?
24	83	Campione and Brown (1978)	Toward a theory of intelligence: Contributions from research with retarded children.
25	81	Lewis and Brooksgunn (1981)	Visual attention at 3 months as a predictor of cognitive functioning at 2 years of age.

Note: citation scores according to official count in ISI Web of Science as of June 23rd, 2009.

importance of inhibitory processes (Dempster, 1991), a review paper on mental retardation (Campione & Brown, 1978), a theory on personality, interests, and knowledge (Ackerman, 1996), an overview of the role of *g* in everyday life (Gottfredson, 1997), a study of the stability of IQ over a period of 66 years (Deary, Whalley, Lemmon, Crawford, & Starr, 2000), a study that put Spearman's law of diminishing returns back on the agenda (Detterman & Daniel, 1989), a study of the factorial nature of cognitive abilities (Gustafsson, 1984), a paper on complexity of intelligence with a now famous radex figure (Marshalek, Lohman, & Snow, 1983), papers on inspection and reaction time (Jensen & Munro, 1979; Kranzler & Jensen, 1989; Vernon, 1983), a methodological study on *g* (Jensen & Weng, 1994), an overview of ever relevant behavior genetic studies (Plomin & Defries, 1980), studies with tests of infant cognition (Fagan & McGrath, 1981; Lewis & Brooksgunn, 1981), papers on emotional intelligence (Mayer, Caruso, & Salovey, 1999; Mayer & Salovey, 1993), seminal studies on the relation between intelligence and brain functioning and brain size (Haier, Siegel, Tang, Abel, & Buchsbaum, 1992; Haier et al., 1988; Willerman, Schultz, Rutledge, & Bigler, 1991). The list includes an eloquent paper on general intelligence by a former president of the Psychometric Society (Humphreys, 1979) that is still relevant today. If only S. J. Gould (1981) had read that paper, he would perhaps not missed the point concerning factor analysis (Bartholomew, 2004; Jensen & Weng, 1994).

All these papers are suitable course materials. The list includes must-reads in the study of intelligence. The papers cover the most important topics related to intelligence. Although in my view, work on *how* intelligence develops over the life span (e.g., van der Maas et al., 2006), good evolutionary theories, and some psychometric issues appears to be underrepresented. Both the Top 25 and virtually all current and past issues of the journal reflect the multidisciplinary character of the field, which comprises an interesting mix of neurophysiological, methodological, factor analytical, behavior genetic, developmental, sociological, biological, cognitive, personality, and psychometric topics. Since its inception, *Intelligence* has clearly met its goal of furthering our understanding of intelligence. It is fair to conclude that the field still has work to do to unravel the nature of intelligence. However, as early ability is quite predictive of later success (Deary et al., 2000; Fagan & McGrath, 1981), I am quite confident that the contributors to *Intelligence* will rise to the challenges that lie before us.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.intell.2009.06.004.

References

Ackerman, P. L. (1996). A theory of adult intellectual development: Process, personality, interests, and knowledge. *Intelligence*, *22*, 227–257.

Bartholomew, D. J. (2004). *Measuring intelligence. Facts and fallacies.* Cambridge, UK: Cambridge University Press.

Brumback, R. A. (2008). Worshiping false idols: The impact factor dilemma. *Journal of Child Neurology*, *23*, 365–367.

Campione, J. C., & Brown, A. L. (1978). Toward a theory of intelligence: Contributions from research with retarded children. *Intelligence*, *2*, 279–304.

Cantor, J., Engle, R. W., & Hamilton, G. (1991). Short-term memory, working memory, and verbal abilities — How do they relate? *Intelligence*, *15*, 229–246.

Conway, A. R. A., Cowan, N., Bunting, M. F., Therriault, D. J., & Minkoff, S. R. B. (2002). A latent variable analysis of working memory capacity, short-term memory capacity, processing speed, and general fluid intelligence. *Intelligence*, *30*, 163–183.

Deary, I. J., Whalley, L. J., Lemmon, H., Crawford, J. R., & Starr, J. M. (2000). The stability of individual differences in mental ability from childhood to old age: Follow-up of the 1932 Scottish mental survey. *Intelligence*, *28*, 49—55.
Dempster, F. N. (1991). Inhibitory processes — A neglected dimension of intelligence. *Intelligence*, *15*, 157—173.
Detterman, D. K. (1977). Is Intelligence necessary? *Intelligence*, *1*, 1—3.
Detterman, D. K., & Daniel, M. H. (1989). Correlations of mental tests with each other and with cognitive variables are highest for low IQ groups. *Intelligence*, *13*, 349—359.
Fagan, J. F., & McGrath, S. K. (1981). Infant recognition memory and later intelligence. *Intelligence*, *5*, 121—130.
Gottfredson, L. S. (1997). Why g matters: The complexity of everyday life. *Intelligence*, *24*, 79—132.
Gould, S. J. (1981). *The mismeasure of man.* New York: W.W. Norton.
Gustafsson, J. E. (1984). A unifying model for the structure of intellectual abilities. *Intelligence*, *8*, 179—203.
Haier, R. J., Siegel, B., Tang, C., Abel, L., & Buchsbaum, M. S. (1992). Intelligence and changes in regional cerebral glucose metabolic-rate following learning. *Intelligence*, *16*, 415—426.
Haier, R. J., Siegel, B. V., Nuechterlein, K. H., Hazlett, E., Wu, J. C., Paek, J., et al. (1988). Cortical glucose metabolic-rate correlates of abstract reasoning and attention studied with positron emission tomography. *Intelligence*, *12*, 199—217.
Humphreys, L. G. (1979). The construct of general intelligence. *Intelligence*, *3*, 105—120.
Jensen, A. R., & Munro, E. (1979). Reaction time, movement time, and intelligence. *Intelligence*, *3*, 121—126.
Jensen, A. R., & Weng, L. J. (1994). What is good g? *Intelligence*, *18*, 231—258.
Kranzler, J. H., & Jensen, A. R. (1989). Inspection time and intelligence — A meta-analysis. *Intelligence*, *13*, 329—347.
Kröner, S., & Biermann, A. (2007). The relationship between confidence and self-concept — Towards a model of response confidence. *Intelligence*, *35*, 580—590.
Kyllonen, P. C., & Christal, R. E. (1990). Reasoning ability is (little more than) working-memory capacity?! *Intelligence*, *14*, 389—433.
Lewis, M., & Brooksgunn, J. (1981). Visual attention at 3 months as a predictor of cognitive functioning at 2 years of age. *Intelligence*, *5*, 131—140.
Lynn, R., & Mikk, J. (2007). National differences in intelligence and educational attainment. *Intelligence*, *35*, 115—121.
Marshalek, B., Lohman, D. F., & Snow, R. E. (1983). The complexity continuum in the radex and hierarchical-models of intelligence. *Intelligence*, *7*, 107—127.
Mayer, J. D., Caruso, D. R., & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence*, *27*, 267—298.
Mayer, J. D., & Salovey, P. (1993). The intelligence of emotional intelligence. *Intelligence*, *17*, 433—442.
Molenaar, D., Dolan, C. V., & Wicherts, J. M. (2009). The power to detect sex differences in IQ test scores using multi-group covariance and means structure analyses. *Intelligence*, *37*, 396—404.
Plomin, R., & Defries, J. C. (1980). Genetics and intelligence — Recent data. *Intelligence*, *4*, 15—24.
Reeve, C. L., & Lam, H. (2007). Consideration of g as a common antecedent for cognitive ability test performance, test motivation, and perceived fairness. *Intelligence*, *35*, 347—358.
Süß, H. M., Oberauer, K., Wittmann, W. W., Wilhelm, O., & Schulze, R. (2002). Working-memory capacity explains reasoning ability — and a little bit more. *Intelligence*, *30*, 261—288.
Templer, D. I., & Arikawa, H. (2006). Temperature, skin color, per capita income, and IQ: An international perspective. *Intelligence*, *34*, 121—139.
van der Maas, H. L. J., Dolan, C. V., Grasman, R. P. P. P., Wicherts, J. M., Huizenga, H. M., & Raijmakers, M. E. J. (2006). A dynamical model of general intelligence: the positive manifold of intelligence by mutualism. *Psychological Review*, *113*, 842—861.
Vernon, P. A. (1983). Speed of information-processing and general intelligence. *Intelligence*, *7*, 53—70.
Wicherts, J.M., Borsboom, D., & Dolan, C.V. (in press). Why national IQs do not support evolutionary theories of intelligence. *Personality and Individual Differences*. doi:10.1016/j.paid.2009.05.028.
Wicherts, J.M., Dolan, C.V., & van der Maas, H.L.J. (in press). A systematic literature review of the average IQ of sub-Saharan Africans. *Intelligence*. doi:10.1016/j.intell.2009.05.002.
Willerman, L., Schultz, R., Rutledge, J. N., & Bigler, E. D. (1991). In vivo brain size and intelligence. *Intelligence*, *15*, 223—228.