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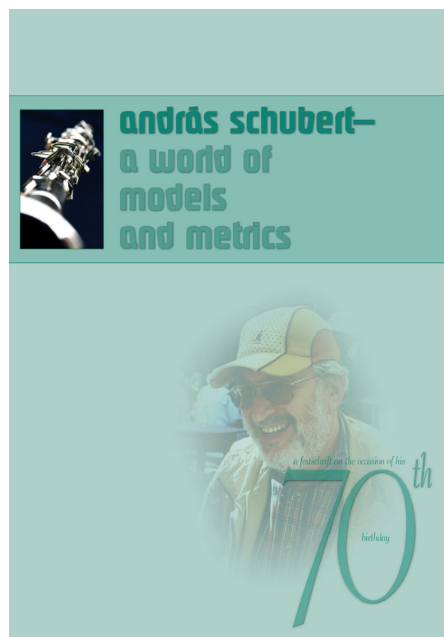
## THE WORLD OF MODELS AND METRICS

### A FESTSCHRIFT ON THE OCCASION OF ANDRÁS SCHUBERT'S 70<sup>th</sup> BIRTHDAY

WOLFGANG GLÄNZEL & BALÁZS SCHLEMMER

This festschrift on the occasion of András Schubert's 70<sup>th</sup> birthday has been published as a special issue of the ISSI periodical. The electronic version is available via the Society's website at <http://www.issi-society.org/andrasschubert70/>.

About forty authors, colleagues and friends have submitted academic contributions and homages, letters, short communications and articles to portray way and work of a unique scholar in the broad area of quantitative science studies. However, mirroring the professional careers of other outstanding scientometri-



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ISSI  
International society for scientometrics and informetrics

cians of his generation, András Schubert, too, started his career in one of the established science fields. He is a skilled chemist and despite of his new commitments in scientometrics, he has remained true to his roots and succeeded in combining the two areas of activity. In both fields he has two big passions, models and measures. The about 25 pieces collected in this volume portray his work and impact on the community from these perspectives.

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# AESIS

## Network for the Assessment & Evaluation of the Societal Impact of Science

THE IMPACT OF SCIENCE CONFERENCE, 8-10 JUNE 2016



### IMPACT OF SCIENCE, 9-10 JUNE 2016

The annual **Impact of Science** conference brings together the different stakeholders on the societal impact of science. This year the conference focuses primarily on governmental and institutional methods to advance the societal impact of science, and the methods needed to assess the impact sufficiently. The conference will be chaired by Prof. Paul Boyle, President & Vice-Chancellor of the University of Leicester. Confirmed speakers include Prof. Daniel Zajfman, President of the Weizmann Institute of Science, Tobin Smith, Vice-President for Policy at Association of American Universities, and Prof. Louise Gunning-Schepers, Chair of the Dutch National Research Agenda.

Policymakers and scientists would benefit from matching their frameworks for

accountability towards society. When discussing the societal impact of science some policymakers seem to prefer to raise the Societal Impact on Science, where the Societal Impact of Science should be the central goal. Science policymakers need to understand to what extent one impact the other. To accomplish this proven methods and best practices of measuring and demonstrating impact plays an important role. Without this both sides are less able to justify and give account to society. In June experts from various stakeholders will provide a professional view on implementing these matters.

### IMPACT OF EU FUNDED RESEARCH, 8 JUNE 2016

The conference is preceded by a pre-conference seminar on the Impact of EU funded research. This seminar focuses on new

insights on the impact of Horizon 2020 & EIT for economies and societies. Both programmes are facing midterm reviews this year which is an excellent time to discuss the impact of programmes like these on society and how to advance this. What is the synergy between national and European research funding programmes? How can this be improved and the impact increased? Attendees will gain insight on what the impact of the current programmes is and what can be done to change European impact strategies and evaluation practices to increase the impact in the future. We were able to bring together key stakeholders: Martin Kern, Director a.i. of the European Institute for Innovation and Technology (EIT), Kurt Vandenberghe represents Horizon2020 and Alex Brenninkmeijer is a member of the relevant chamber at the European Court of Auditors. These will be the plenary speakers of the day, under the chairmanship of Prof. Koenraad Debackere, General Manager at Leuven University and chairman of the AESIS Network.

## AESIS NETWORK

The network connects different stakeholders in advancing and evaluating the impact of science:

- ▶ Research managers who have to demonstrate societal impact;
- ▶ Science assessment experts who process data and analyse instruments for this;
- ▶ Science funders/policy makers who have to evaluate this societal impact.

The importance of merging weakly connected pools of experience and expertise follows from our conviction that the pro-

fessionalisation in demonstrating and advancement of the diverse impacts of science will, eventually, substantiate and support investments in public research.

## ACTIVITIES OF THE AESIS NETWORK

The AESIS Network will create a platform to share experiences, ideas and best practices regarding measuring, demonstrating and advancing the societal impact of science. International exchange of best practices is stimulated through the annual conference Impact of Science and through regional activities with a specific focus. Annually, there are two main activities organised. The first regional event was a 3-day international course for science funding experts and research programme designers in London.

Besides activities directly related to the mission, the Network distributes relevant publications, discussions and opinions through a quarterly newsletter. Best practices, examples and case studies can set a benchmark in research evaluations to demonstrate the societal impact of science.

## MEMBERSHIP

Membership of the Network is free. As a member, you will be able to submit content to the Network newsletter and get priority registration at a reduced participation fee in Network events. Please register here <http://aesisnet.com/join-us/>. Join us now!

## CONTACT

### The AESIS Network

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# THE 21<sup>st</sup> NORDIC WORKSHOP ON BIBLIOMETRICS AND RESEARCH POLICY

## CALL FOR PAPERS

3–4 NOVEMBER 2016  
COPENHAGEN, DENMARK

## LOCATION

Aalborg University, Copenhagen Campus (AAU-CPH), in Copenhagen.

AAU-CPH is located in the South Harbour in Copenhagen 15 minutes from the city centre in the former R&D facilities of Nokia. The AAU-CPH campus has more than 5000 students and 500 academics in all fields of research, and is sited in a prime location with stunning harbour views and top conference facilities. Hotels are available in the area as well as in the city centre.

## WORKSHOP ORGANIZERS

- ▶ Birger Larsen
- ▶ Toine Bogers

## SPONSORING COORDINATOR

Marianne Gauffriau

## DATE OF WORKSHOP

3–4 November 2016

## ABOUT THE WORKSHOP

Bibliometric researchers in the Nordic countries have arranged annual Nordic workshops on bibliometrics since 1996.

The general scope of the workshop is to present recent bibliometric research in the Nordic countries, to create better linkages between the bibliometric research groups and their PhD students, and to link bibliometric research with research policy. The workshop language is English and the workshop is open to participants from any nation. See the workshop website for more information: <http://nwb.aau.dk>

## PREVIOUS WORKSHOPS

- ▶ 1996 Helsinki
- ▶ 1997 Stockholm
- ▶ 1998 Oslo
- ▶ 1999 Copenhagen
- ▶ 2000 Oulu
- ▶ 2001 Stockholm
- ▶ 2002 Oslo
- ▶ 2003 Aalborg
- ▶ 2004 Turku
- ▶ 2005 Stockholm
- ▶ 2006 Oslo
- ▶ 2007 Copenhagen
- ▶ 2008 Tampere
- ▶ 2009 Stockholm
- ▶ 2010 Bergen
- ▶ 2011 Copenhagen
- ▶ 2012 Helsinki
- ▶ 2013 Stockholm
- ▶ 2014 Reykjavik
- ▶ 2015 Oslo



Aalborg University Copenhagen, Denmark. Photo copyright: © Jørgen True/StudieE



## SUBMISSION OF ABSTRACTS

Workshop submissions consist of abstracts and we are in particular seeking novel ideas or work-in-progress of interest to a Nordic audience and if possible policy-related. Deadline for submission of abstracts (250 words) is 1<sup>st</sup> of September, 2016. Please send abstracts to: [toine@hum.aau.dk](mailto:toine@hum.aau.dk)

## CONTACT

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# 12<sup>th</sup> INTERNATIONAL CONFERENCE ON WEBOMETRICS, INFORMETRICS AND SCIENTOMETRICS (WIS) & 17<sup>th</sup> COLLNET MEETING

## CALL FOR PAPERS

DECEMBER 12–15, 2016  
NANCY, FRANCE

<http://www.slp.org.in/collnet2016/>

## SCOPE

The broad focus of the conference is on collaboration and communication in science and technology; science policy; quantitative aspects of science of science; and combination and integration of qualitative and quantitative approaches in study of scientific practices. The conference thus aims to contribute to evidence-based and informed knowledge about scientific research and practices which in turn may further provide input to institutional, regional, national and international research and innovation policy making. Theoretical, methodological and applied aspects, for example:

### A. EMERGING ISSUES IN SCIENTOMETRICS / INFORMETRICS / WEBOMETRICS AND HISTORY

- ▶ Science Policy, Collaboration and History
- ▶ Collaboration Studies for Science & Society
- ▶ Collaboration, Knowledge Management & Industrial Partnership
- ▶ Collaborative Bridge between Academic Research and Industry
- ▶ Techniques for Collaboration Studies
- ▶ Visualization Techniques in Collaboration Studies
- ▶ Quantitative Analysis of S&T Innovations



- ▶ Informetrics Laws and Distributions, Mathematical Models of Communication or Collaboration
- ▶ Nature and Growth of Science and of Collaboration in Science and its Relation with Technological Output
- ▶ Evaluation Indicators
- ▶ Collaboration in Science and in Technology from both Quantitative and Qualitative Points of View
- ▶ Informetrics Laws and Distributions

## B. DATA MANAGEMENT

- ▶ Data analytics and data mining
- ▶ Open access management and its impact

## C. INFORMATION TECHNOLOGY AND MANAGEMENT

- ▶ Information & Knowledge Measurement
- ▶ Information Literacy Program
- ▶ Technology & Innovations in Libraries and Impact Measurement
- ▶ Development and Assessment of Digital Repositories
- ▶ Economic Co-operation & Development
- ▶ Historical and Comparative case studies related to Librarianship

Please, note that these examples listed above give a broad outline of the scope of the workshop theme but do not limit it!

## COLLNET & WIS HISTORY 2000-2015 (WIS: WEBOMETRICS, INFORMETRICS, SCIENTOMETRICS)

COLLNET is a global interdisciplinary research network of scholars who are concerned to study aspects of collaboration in science and in technology (see COLLNET web site at: <http://www.collnet.de/>). This network of interdisciplinary scholars was established in January 2000 in Berlin with Hildrun Kretschmer as coordinator. Since that time there have been thirteen meet-

ings: the first in Berlin, September 2000, the 2nd in New Delhi, February 2001 and the 3rd in Sydney (in association with the 8th ISSI Conference), July 2001. The 4th COLLNET Meeting took place on August 29th in 2003 in Beijing in conjunction with the 9th International ISSI Conference; the First International Workshop on Webometrics, Informetrics and Scientometrics (WIS) and 5th COLLNET Meeting in Roorkee, India, in March 2004. The 6th COLLNET Meeting took place in association with the 10th ISSI Conference in Stockholm, Sweden, in July 2005.

The Second International Workshop on Webometrics, Informetrics and Scientometrics (WIS) and 7th COLLNET Meeting was organized in Nancy, France, in May 2006.

The Third International Conference on WIS and Science and Society & Eighth COLLNET Meeting took place in New Delhi, India, in March 2007 (<http://www.collnet-delhi.de>), the Fourth International Conference on WIS & Ninth COLLNET Meeting in Berlin, Germany in July 2008 (<http://www.collnet-berlin.de>) and the Fifth International Conference on WIS & Tenth COLLNET Meeting in Dalian, China, in September 2009 (<http://www.wiselab.cn/collnet-dalian/>). The Sixth International Conference on WIS & Eleventh COLLNET Meeting took place in Mysore, India, in October 2010, the Seventh International Conference on WIS & Twelfth COLLNET Meeting in Istanbul, Turkey, in September 2011 (<http://collnet.cs.bilgi.edu.tr/>), the 8th International Conference on WIS & 13th COLLNET Meeting in Seoul, Korea, October, 2012, Seoul, Korea, <http://collnet2012.ndsl.kr>; the 9th International Conference on WIS & 14th COLLNET Meeting, August, 2013 in Tartu, Estonia, <http://www.etag.ee/international-research-cooperation/collnet-2013/?lang=en>, September 3-5, 2014 in Ilmenau, Germany, <http://www.tu-ilmenau.de/collnet2014>, November 26-28, 2015 in New Delhi, India, <http://www.slp.org.in/collnet2015/>



## COLLNET CONFERENCE 2016:

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- ▶ PROGRAMME COMMITTEE:  
COLLNET Members  
<http://www.collnet.de/>

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- ▶ Regional Chair of Africa, America, Australia and Europe:  
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- ▶ Regional Chair of China:  
Liang Liming (China)
- ▶ Regional Chair of India:  
Ramesh Kundra (India)  
Team:  
N.K. Wadhwa (India)  
Divya Srivastava (India)  
Sujit Bhattacharya (India)
- ▶ Regional Chair of Iran:  
Farideh Osareh (Iran)

### COLLNET JOURNAL OF SCIENTOMETRICS AND INFORMATION MANAGEMENT

- ▶ Chief Editor: I.K. Ravichandra Rao
- ▶ Editor: Hildrun Kretschmer

## CALL FOR ORAL AND POSTER PRESENTATIONS

### IMPORTANT DATES, ORAL PRESENTATION:

- ▶ *July 15, 2016 (Deadline),*  
Extended Abstract, (3 pages, abstracts less than 2.5 pages are not accepted)

Please send your extended abstracts to:  
Hildrun Kretschmer  
kretschmer.h@onlinehome.de

and to

Jean-Charles Lamirel  
lamirel@loria.fr

Please send also a copy to:  
collnet2016@gmail.com

- ▶ *August 15th, 2016,*  
Acceptance Notification
  - ▶ *October 15th, 2016 (Deadline),*  
Full Paper (Camera-ready version, maximum 10 pages including tables, figures, references)
- The extended abstracts will be peer reviewed by the Programme Committee.

### IMPORTANT DATES, POSTER PRESENTATION:

- ▶ *September 1st, 2016 (Deadline)*  
Abstract for Poster Presentation (1 page)

### IMPORTANT DATES, REGISTRATION DEADLINE AND CONFERENCE

- ▶ *December 1st, 2016*  
Registration deadline
- ▶ *December, 12-15th, 2016*  
Conference

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# GALTON 2016: THE BIBLIOMETRIC JOURNEY CONTINUES\*



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## ABSTRACT

Francis Galton was not only a universal genius; he can also be regarded as a scientometric pioneer. On the occasion of his 100th death anniversary in 2011, he was used as a role model for a bibliometric impact analysis of his works. This is the follow-up study of a previous citation analysis, which was expanded by introducing ProQuest Dissertations & Theses (PQDT) as a complementary data source. Additionally all retrieved documents in WoS either citing or mentioning Galton were visualized using Bibexcel, Pajek and VOS Viewer. Furthermore Galton's h-index and g-index were calculated and found to be very high compared to other historic scientific personalities.

The citation-to-obliviation ratio was different for PQDT in comparison to WoS or Scopus. Visualization allows better interpretation and understanding of the obtained results and is useful for the identification of eponyms.

Overall citation analysis and occurrence counting are complementary useful methods for the impact analysis of the works of "giants". This type of retrospective bibliometric studies presents an interesting and promising field of activity for librarians and information specialists.

**Keywords:** Francis Galton, citation analysis, obliviation, history of science, visualisation, h-index, g-index, theses, dissertations, Web of Science, Scopus, Google Scholar, ProQuest Dissertations & Theses

## 1. BACKGROUND

Francis Galton was an all-rounder of science that lived in the 19th century. Driven by his own curiosity he contributed to various fields like Geography, Meteorology, Psy-

chology and Genetics. He was particularly enthusiastic about counting and quantifying everything. This obsession can not only be regarded as the stimulus for the foundation of scientometrics. It also radically changed social sciences which then increas-

\* Part of this study was presented at the QQML 2012 4th International Conference on Qualitative and Quantitative Methods in Libraries held in Limerick Ireland (<http://www.isast.org/importantdates/qqml2012.html>)



ingly relied on quantified measurements and statistical methods. It was Galton who introduced regression, correlation and percentiles as new statistical concepts; simply to deal with the huge amount of data he accumulated (Obituary, 1911; Enciclopedia Italiana, 1950; Forrest, 1974; Gillham, 2001).

Galton was fascinated by the measurement of science (Godin, 2007). “Hereditary Genius” (1869) and “English Men of Science” (1874) are major contributions to this field. The first can be regarded as history’s first example of historiometry (Wikipedia, 2012), whereas the latter inspired Cattell to publish his directory “American Men of Science” (Cattell, 1906) more than thirty years later. Moreover Galton was a pioneer of mapping science. The results of his famous beauty map of the British Isles were compared to a beauty map of London recently compiled by Swami and Hernandez (2008).

Galton passed away in 1911, leaving more than 300 papers and almost 20 books for posterity.

This bibliometric analysis is the continuation of a previous study in appreciation of the crucial contributions of Galton to scientometrics.

## 2. RETROSPECTIVE INTRODUCTION

In a previous study (Gorraiz, Gumpenberger and Wieland; 2011) citation analysis of Galton’s works was done in Web of Science, Scopus and Google Scholar (Publish or Perish) in order to retrieve his most frequently cited books and journal articles. The retrieved book and journal article citations were extensively analysed. This citation analysis was then complemented by an analysis of references where Galton is rather mentioned than cited, a phenomenon generally known as obliteration by incorporation. In addition occurrences of Galton’s works were counted in major encyclopaedias, biographical indexes, in obituaries, Festschriften and the website Galton.org.

Correlation analyses of the most cited books with occurrences in biographical sources and encyclopaedias were performed using the Pearson correlation coefficient.

The major findings were that Galton’s works turned out to be increasingly cited or mentioned. The phenomenon of obliteration (i.e. the use of eponyms) applies to the remarkable proportion of up to one third of Galton’s works. Whether scientists are cited or rather only mentioned either depends on the respective subject field or on the country-specific cultural behaviour. Our findings suggest that obliteration is probably more common in selected subject areas like mathematics and statistics (formulas, processes, effects, etc. are named after a person) than e.g. in psychology.

## 3. SCOPE OF THE ANALYSIS

This subsequent bibliometric analysis comprises of the following new aspects:

- a. The data sources were expanded by introducing “ProQuest Dissertations & Theses (PQDT)” with regard to the aspect of “citation vs. obliteration”.
- b. All documents retrieved in Web of Science (WoS) citing or mentioning Galton were visualized in order to better illustrate the varied impact of Galton’s work and the significance of his individual contributions as well as to identify relevant networks. A selection of maps is presented in the results part.
- c. Correlation analyses between data sources WoS, Scopus and Google Scholar were expanded by PQDT for Galton’s most cited books and journal articles.
- d. Calculation of the h-index and g-index in different databases and comparison with the h-index of other giants in similar studies was performed.



## 4. METHODOLOGY

### ANALYSIS IN “PROQUEST DISSERTATIONS & THESES (PQDT)”

One goal of the follow-up study was to extend our correlation analyses between occurrences and citations – so far only performed for monographs – also to journal articles. However, it became evident that these are hardly cited or mentioned in encyclopaedias and biographic indexes, whereas dissertations and theses have so far been neglected. “ProQuest Dissertations & Theses (PQDT)” recently allows searching for cited documents and therefore enabled the inclusion of theses and dissertations as important document types in our analyses (Andersen and Hammarfelt, 2011).

This complementary data source is advertised as being the world’s most comprehensive collection of dissertations and theses. PQDT includes 2.7 million searchable citations to dissertation and theses from around the world from 1861 to the present day together with 1.2 million full text dissertations that are available for download in PDF format.

Searches in PQDT were done in March 2012 in order to identify the most cited and also the most mentioned documents (monographs and journal articles). The search included only the years 2006-2012, since citation data are not available in PQDT prior to 2006. Search strategy and manual disambiguation were similar to the procedures described in the previous study (Gorraiz, Gumpenberger and Wieland; 2011). Searches were done in title, descriptors, identifiers and abstracts, and despite of the fact that PQDT allows to search the full text, this feature was not used for comparability reasons.

### COMPARATIVE VIEW OF “CITATION VS. OBLITERATION”

The new results obtained from the PQDT analysis were combined with the results

from the previous study performed in WoS and Scopus. A chart was produced in Excel to compare the citation-to-oblivation ratio for each database.

### VISUALIZATION

Visualization was done with the freely available software packages BibExcel, VOSviewer and Pajek. BibExcel is a software intended to analyse bibliographic data to generate data files that can be imported to Excel (or any programme suitable to process tabbed data) for further processing (BibExcel, 2012). VOSviewer is intended to analyse bibliometric networks by creating, viewing and exploring maps (VOSviewer, 2012). Pajek (Slovene word for Spider) is a Windows based programme for the analysis and visualization of large networks (Pajek, 2011).

Comparative maps were produced representing either WoS categories, WoS Author Keywords, WoS KeyWords Plus® (index terms created by Thomson Reuters from significant, frequently occurring words in the titles of an article’s cited references) or WoS Abstracts for both the cited and the mentioned works of Galton.

### CORRELATION ANALYSIS

The previous Pearson correlation analyses between the different data sources (WoS, Scopus, Google Scholar) for Galton’s most cited monographs as well as journal articles were expanded by introducing PQDT as complimentary data source.

### H-INDEX AND G-INDEX

The h-index and the g-index were calculated in the different databases compared to the results obtained in similar studies (Marx, Cardona and Lockwood, 2011). For WoS data the h-index was furthermore calculated separately for the journal articles as well as for the monographs.



	WOS (ALL)	WOS (2006-2012)	SCOPUS (ALL)	SCOPUS (2006-2012)	PQDT (2006-2012)
citing documents	4808	1234	3537	1826	326
mentioning documents	1215	363	994	345	19
both	214	74	194	101	2

Table 1: analysed documents in WoS, Scopus and PQDT

## 5. RESULTS

### RESULTS FROM THE COMPARISON “CITING” VS. “MENTIONING”:

Table 1 shows the absolute numbers of retrieved documents in WoS, Scopus and PQDT, whereas Figure 1 is a comparative depiction of the citation-to-oblivation ratio expressed in percentages for each analysed database in the period 2006-2012.

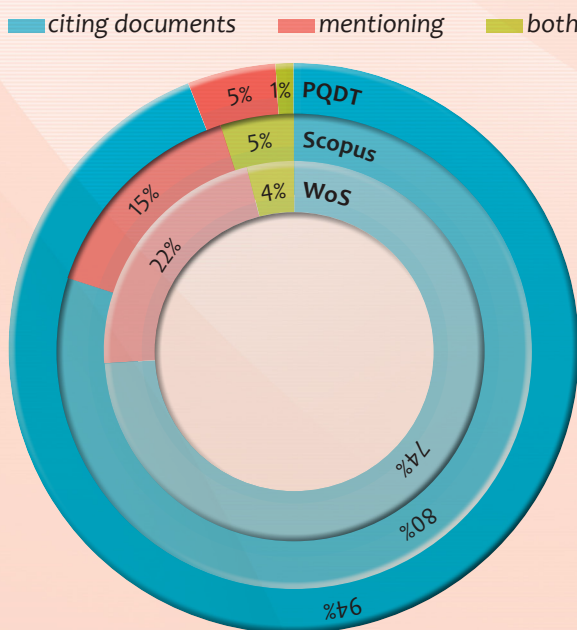


Figure 1: Comparison “citing” vs. “mentioning” for WoS, Scopus and PQDT (all for 2006-2012)

50% of all mentioning documents in all databases refer to the “Galton-Watson-process(es)” and confirms that this is the most important eponym

The citation-to-oblivation ratio is similar for both WoS and Scopus. Even fewer mentioning documents could be retrieved in PQDT.

### RESULTS FROM VISUALIZATION:

#### Comparison citation vs. obliteration —WoS categories

The works citing Galton form two visible fronts as obvious from Fig. 2. The first (and main) cluster comprises of the WoS categories Psychology, Psychiatry, Behavioral Sciences and Genetics & Heredity. The second cluster includes Statistics & Probability, Computer Science, Social Sciences as well as Sociology/Demography. Both are linked to each other. In addition Anthropology, Zoology and Evolutionary Biology can be identified as isolated WoS categories.

Fig. 3 depicts the major WoS categories for the works mentioning Galton. Again two clusters are visible. The first cluster comprises of the WoS categories Statistics & Probability, Biology, Genetics and Social Sciences, the second one of Mathematics. Both clusters are not connected.

#### Comparison citation vs. obliteration —WoS descriptors

Fig. 4 depicts the WoS author keywords of the works citing Galton. Intelligence, genetics, eugenics, correlation and biometrics stand out as concepts. In comparison Fig. 5 shows the major author keywords including the most important eponyms relating to Galton.

#### Comparison citation vs. obliteration —WoS identifiers

Figure 6 and 7 allow a deeper and more complete insight by using the WoS KeyWords Plus® instead of the author keywords, which are not always available in WoS (included in

14



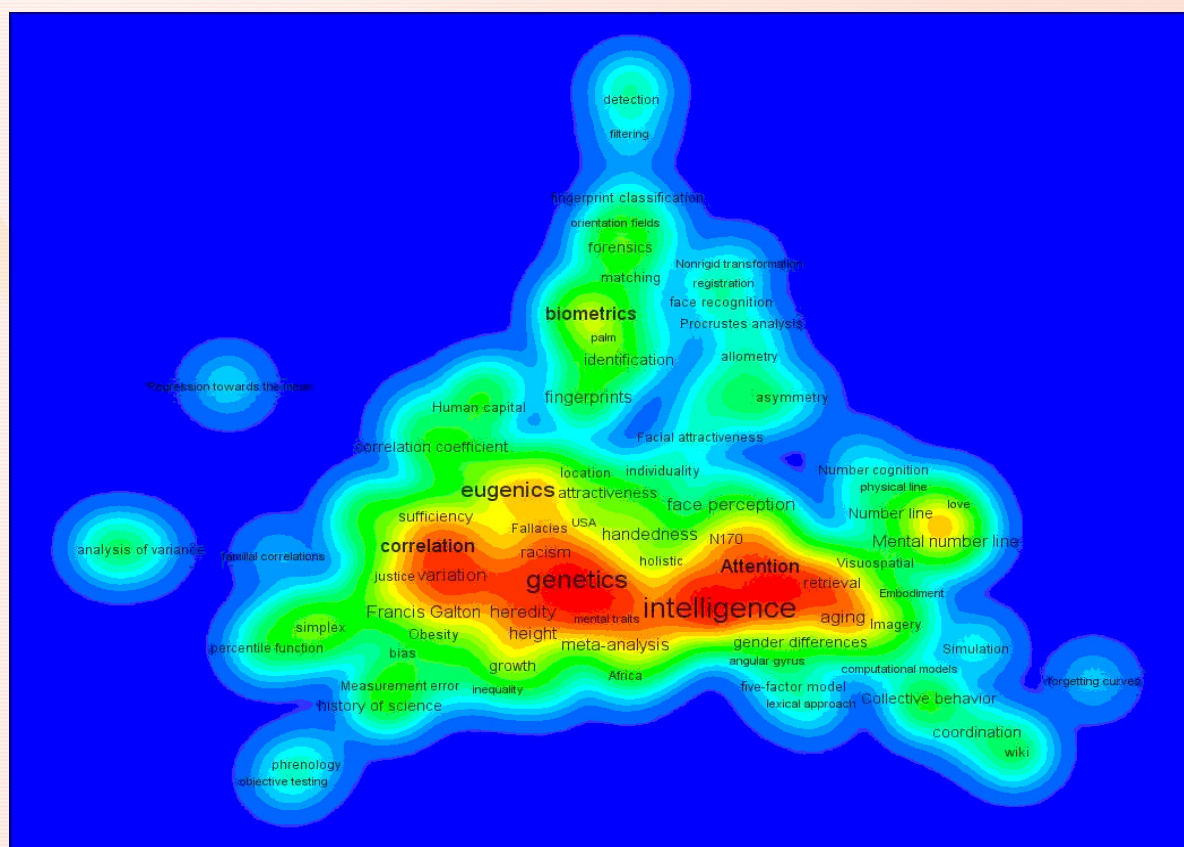


Figure 4. WoS author keywords of the works citing Galton (VOSviewer map)

		WOS				GOOGLE SCHOLAR		SCOPUS		PQDT	
RANK WOS	TITLE (ABBREVIATION)	Most correctly cited Ed. (MCCE)	Most cited Ed. (MCE)	PY MCE	Cits (C) to all Eds	Rank	C	Rank	C	Rank	C
1	INQUIRIES HUMAN FACU*	673	839	1883	1066	11	13	2	351	2	40
2	HEREDITARY GENIUS	274	503	1869	912	1	2004	1	363	1	93
3	NATURAL INHERITANCE	274	356	1889	387	2	657	3	156	5	9
4	ENGLISH MEN SCI THEI	114	222	1874	252	3	377	4	80	4	15
5	FINGER PRINTS	154	213	1892	250	4	338	5	74	3	17
6	MEMORIES MY LIFE	54	111	1908	142	5	185	6	49	7	8
7	ESSAYS EUGENICS	31	48	1909	55	7	85	7	33	6	12
8	NARRATIVE EXPLORER T**	18	28	1853	52	6	101	8	19	9	3
9	FINGER PRINT DIRECTO	6	20	1895	24	9	21	14	1	12	0
10	ART TRAVEL SHIFTS CO	6	8	1855	24	8	31	11	5	8	5
11	METEOROGRAPHICA METH	8	12	1863	12	15	3	9	6	10	1
12	GENIE VERERBUNG***	6	10	1910	10	10	15	12	4	12	0
12	NOTEWORTH FAMILIES	9	10	1906	10	12	6	9	6	10	1
14	RECORD FAMILY FACULT	3	3	1884	3	12	6	15	0	12	0
15	DECIPHERMENT BLURR S	3	3	1893	3	14	5	13	2	12	0

Table 2: Comparative view of Galton's top 15 cited monographs

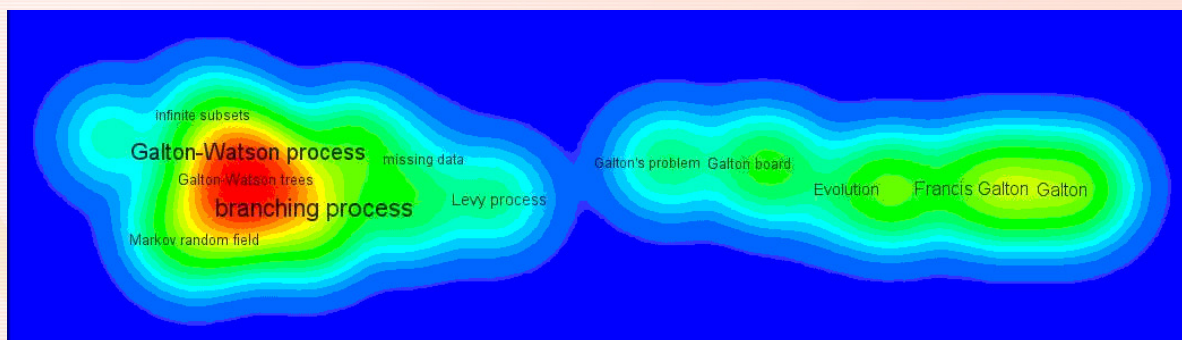


Figure 5. WoS author keywords of the works mentioning Galton (VOSviewer map)

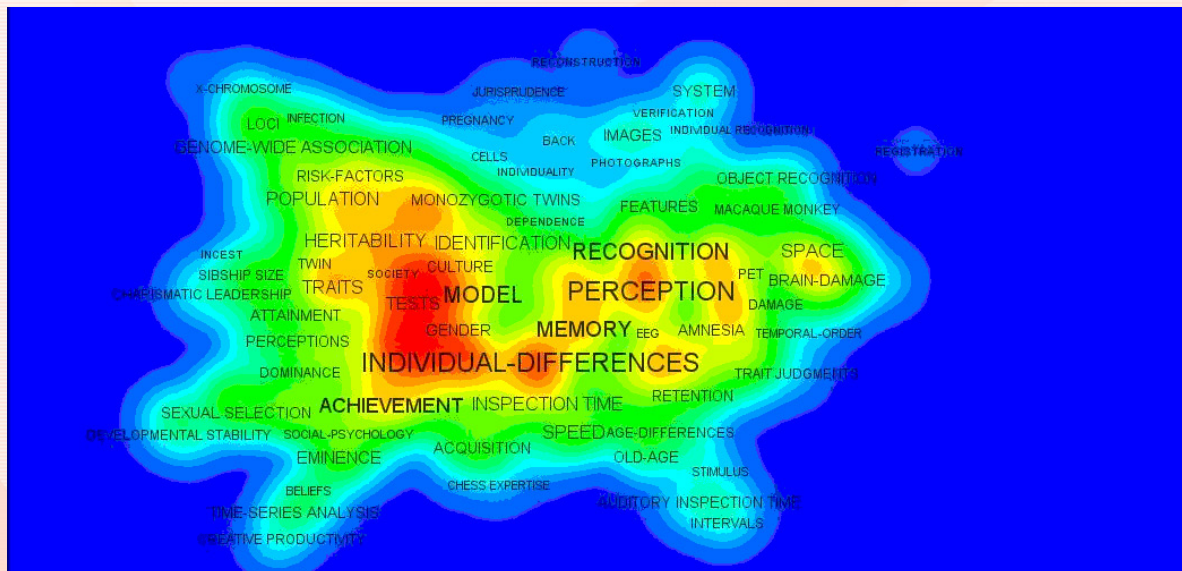


Figure 6. WoS KeyWords Plus® of the works citing Galton (VOSviewer map)

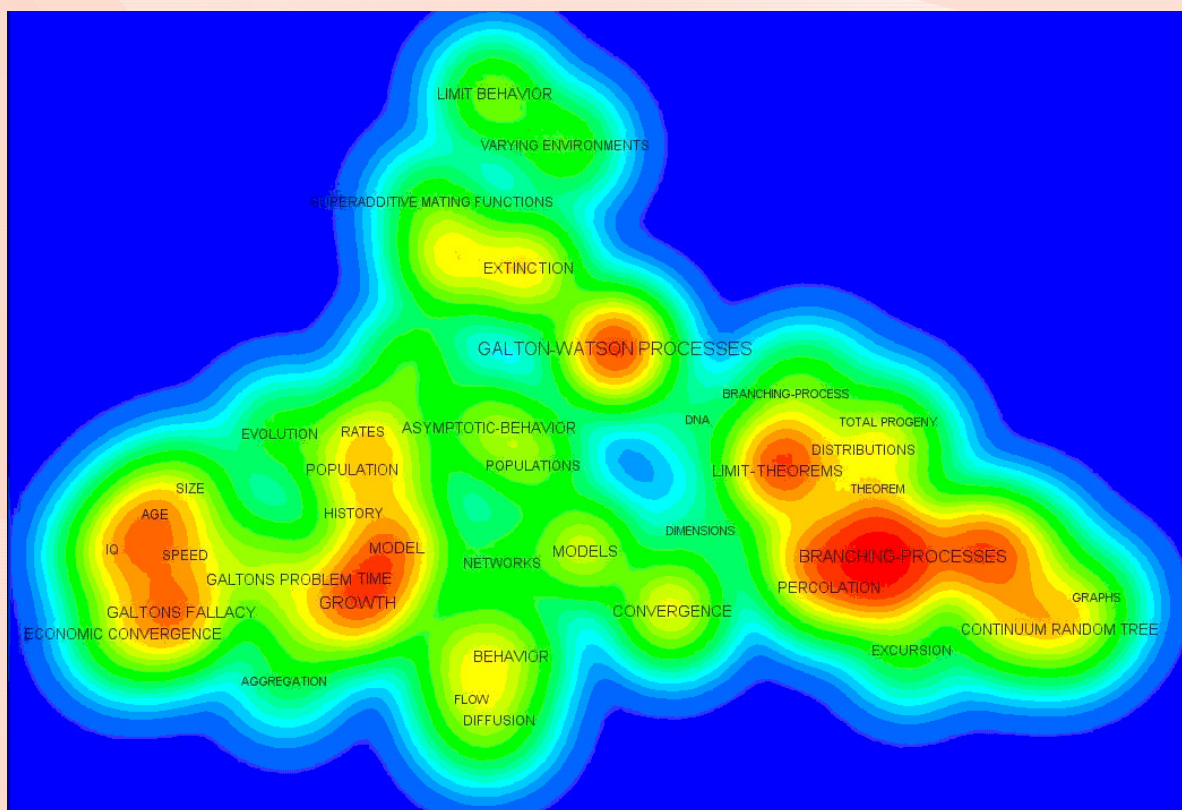


Figure 7. WoS KeyWords Plus® of the works mentioning Galton (VOSviewer map)



TITLE OF ARTICLE	RANK WOS	CITATIONS WOS	RANK GS	CITATIONS GS	RANK SCOPUS	CITATIONS SCOPUS	RANK PQDT	CITATIONS PQDT
Regression towards mediocrity in hereditary stature	1	176	1	347	1	120	3	9
Psychometric experiments	2	162	2	313	2	95	8	3
The history of twins, as a criterion of the relative powers of nature and nurture	3	156	3	237	5	34	5	5
Hereditary talent and character	4	126	4	220	4	57	2	12
Visualised numerals	5	121	8	131	3	85	>10	2
Composite Portraits	6	97	5	162	>10	6	6	4
Co-relations and their measurement	7	80	7	157	9	27	6	4
On the probability of the extinction of families	8	75	6	159	8	28	4	7
The geometric mean	9	68	>10	88	10	26	>10	0
Typical Laws of Heredity	10	63	>10	84	11	25	>10	1
Statistics of mental imagery	11	55	10	94	12	22	10	3
Measurement of character	12	54	0	0	6	33	1	16
Statistical inquiries into the efficacy of prayer	13	47	9	97	7	32	10	3
Eugenics: Its Definition, Scope, and Aims	>13	15	10	94	>12	13	6	4
Personal Identification and Description	>50	1	11	90	>12	8	6	4

Table 3: Comparative view of Galton's top cited journal articles

WoS records of articles from 1991 forward). This way additional eponyms like “Galton's fallacy” can be identified (see Fig. 7).

#### RESULTS FROM CORRELATION ANALYSIS OF DATA SOURCES FOR CITATIONS:

##### *Monographs*

Table 2 shows the 15 most cited Galton's monographs in WoS, Google Scholar, Scopus and PQDT.

##### *Journals*

Table 3 lists the 15 most cited Galton's articles in WoS, Google Scholar, Scopus and PQDT.

Considering Galton's preferred publication strategy, i.e. to publish his results in one subject-specific as well as in one popular journal (Gorraiz, Gumpenberger and Wieland; 2011), publications corresponding to the same title were aggregated.

The corresponding Pearson correlations between all used data sources are presented in Table 4.

The highest correlation is observed between Scopus und WoS when considering monographs, and between WoS and Google Scholar when considering journal articles.

#### D) H-INDEX AND G-INDEX

[See Table 5 on next page.]

## 6. DISCUSSION & CONCLUSIONS

Retrospective bibliometric studies always come with limitations. Citation analyses become challenging due to typos in publication years, different editions of books, different spellings of titles, titles changes or journals volumes covering two publication years (Gorraiz, Gumpenberger and Wieland; 2011). To make things worse the

	WOS / GS	WOS / SCOPUS	GS / SCOPUS	WOS / PQDT	SCOPUS / PQDT	GS / PQDT
Monographs	0.610	0.992	0.689	0.849	0.890	0.875
Journal Articles	0.856	0.784	0.721	0.153	0.189	0.047

Table 4: Pearson correlation coefficients between data sources

	WOS		SCOPUS		GS	
	H-INDEX	G-INDEX	H-INDEX	G-INDEX	H-INDEX	G-INDEX
overall	25	69	21	43	30	81
journals	21	39	16	28	26	54
monographs	11	56	8	34	11	62

Table 5: comparative overview of h-index and g-index values

data sources used for the analyses are also far from perfect. Limited journal coverage, limitations of search fields, data base errors, translation errors, misspelled citations, complex author names, and complicated journal names have all been explicitly mentioned (Marx, 2011) and always need to be taken into account.

Since dissertations can be regarded as an underdeveloped source of analysis in bibliometric research (Andersen and Hammarfelt, 2011), PQDT was added to this analysis as a complementary data source. As outlined before, certain limitations are also evident for this data base. The reference search is not ideal, as citing documents are sometimes retrieved without available references (approximately 17%). These would only be accessible after purchasing the documents of interest.

On the positive side, PQDT would allow searching the full text, which could be a valuable feature to better understand and analyze the phenomenon of obliteration. However, the procedure is cumbersome and can only be explored in further studies.

In spite of the fact that the majority of works are preferably cited, no study would be complete without including the mentioned part. Visualization finally allows a better interpretation and understanding of both aspects and is especially helpful for the identification of relevant eponyms.

Maps can be interesting alternatives to other lengthy data processing procedures.

They are valuable to show the relationships (networks) between the analyzed criteria and therefore certainly appeal to historians and biographers. However, not all maps are equally useful, e.g. in this study maps based on WoS Abstracts turned out to be meaningless for citing documents, and almost similar to the ones based on WoS author keywords for mentioning documents. It is furthermore very helpful to exclude meaningless terms before finally creating the maps.

The outstanding achievements of Galton become evident by simply recognizing the high impact for only his books. Galton's overall h-index of 25 is surprisingly high in comparison to the values determined for other historic scientists, e.g. 20 for Rutherford, 13 for Planck. According to a similar reference multiplier of 30 or 40 as introduced by Marx, Cardona and Lockwood (2011), Galton's present day scaled h-index would rather range between 113 and 116. Separately determined h-index values for monographs and journals articles (based on WoS) need to be taken with a pinch of salt due to the different amount of citations for both publication types. These shortcomings have therefore been addressed by also calculating the g-index based on the citation distribution.

Citation analysis and occurrence counting in biographical sources are considerable methods to study the history, philosophy and sociology of science. Both approaches support the retrieval of the most relevant or



most influential works of outstanding scientists, and their combination even better allows the retrospective unmasking of a “giant’s” publication strategy. The complementary use of both methods results in a merger of the objective nature of citations and the subjective peer perspective of a biographer.

Overall this type of retrospective study should prove librarians and other information specialists that bibliometric activities do not necessarily need to be restricted to evaluative purposes. Expertise can also be successfully applied to other interesting fields of research like the one presented in this study.

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