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Adler, R., Ewing, J. Taylor, P. Citation statistics. A report from the International Mathematical Union.

<http://www.mathunion.org/publications/report/citationstatistics/>

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Order in Spontaneous Behavior

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Alexander Maye¹, Chih-hao Hsieh², George Sugihara², Björn Brembs^{3*}

1 Universitätsklinikum Hamburg-Eppendorf, Zentrum für Experimentelle Medizin, Institut für Neurophysiologie und Pathophysiologie, Hamburg, Germany, **2** Scripps Institution of Oceanography, University of California San Diego, La Jolla, California, United States of America, **3** Freie Universität Berlin, Institut für Biologie-Neurobiologie, Berlin, Germany

Abstract [Top](#)

Brains are usually described as input/output systems: they transform sensory input into motor output. However, the motor output of brains (behavior) is notoriously variable, even under identical sensory conditions. The question of whether this behavioral variability merely reflects residual deviations due to extrinsic random **1** noise in such otherwise deterministic systems or an intrinsic, adaptive indeterminacy trait is central for the basic understanding of brain function. Instead of random noise, we find a fractal order (resembling **1** Lévy flights) in the temporal structure of spontaneous flight maneuvers in tethered *Drosophila* fruit flies. Lévy-like probabilistic behavior patterns are evolutionarily conserved, suggesting a general neural mechanism underlying spontaneous behavior. *Drosophila* can produce these patterns endogenously, without any external cues. The fly's behavior is controlled by brain circuits which operate as a **1** nonlinear system with unstable dynamics far from equilibrium. These findings suggest that both general models of brain function and autonomous agents ought to include biologically relevant nonlinear, endogenous behavior-initiating mechanisms if they strive to realistically simulate biological brains or out-compete other agents.

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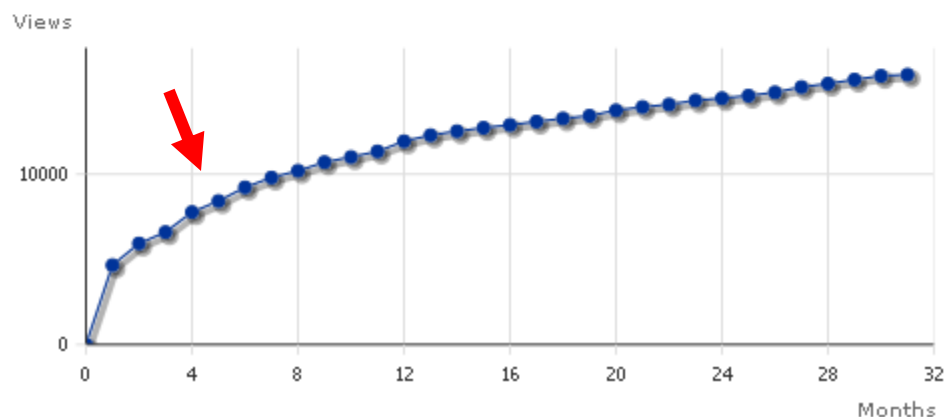
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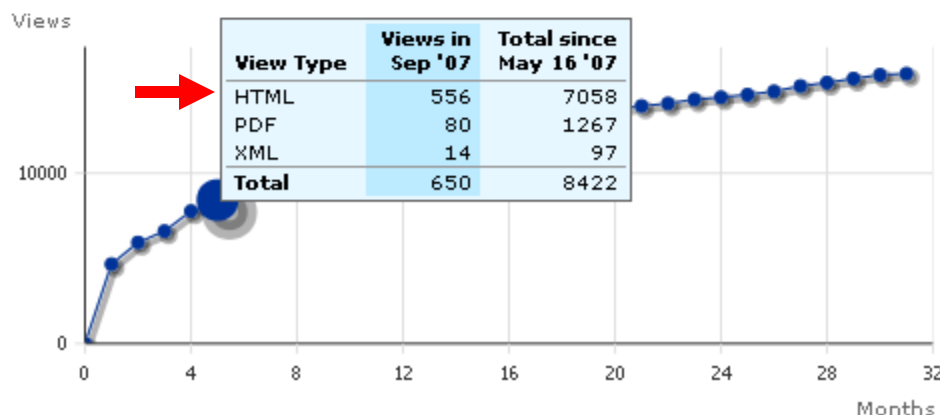
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PLoS ONE, Vol. 4, No. 3. (11 March 2009), e4803.

▼ Abstract

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Ionizing radiation changes the electronic properties of melanin and enhances the growth of melanized fungi.

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Ekaterina Dadachova, Ruth A Bryan, Xianchun Huang, Tiffany Moadel, Andrew D Schweitzer, Philip Aisen, Joshua D Nosanchuk, Arturo Casadevall


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BACKGROUND: Melanin pigments are ubiquitous in nature. Melanized microorganisms are among the dominating species in certain extreme environments, such as soils contaminated with radionuclides, suggesting that the presence of melanin is beneficial in their survival. We hypothesized that ionizing radiation could change the electronic properties of melanin and might enhance the growth of melanized microorganisms. **METHODS/PRINCIPAL FINDINGS:** Ionizing irradiation changed the electron spin resonance (ESR) signal of melanin, consistent with changes in electronic structure. Irradiated melanin manifested a 4-fold increase in its capacity to reduce NADH relative to non-irradiated melanin. HPLC analysis of melanin from fungi grown on different substrates revealed chemical complexity, dependence of melanin composition on the growth substrate and possible influence of melanin composition on its interaction with ionizing radiation. XTT/MTT assays showed increased metabolic activity of melanized *C. neoformans* cells relative to non-melanized cells, and exposure to ionizing radiation enhanced the electron-transfer properties of melanin in melanized cells. Melanized *Wangiella dermatitidis* and *Cryptococcus neoformans* cells exposed to ionizing radiation grew approximately 500 times higher than background grew significantly faster as indicated by higher CFUs, more dry weight biomass and 3-fold greater incorporation of ¹⁴C-acetate than non-irradiated melanized cells or irradiated albino mutants. In addition, radiation enhanced the growth of melanized *Cladosporium sphaerospermum* cells under limited nutrients conditions. **CONCLUSIONS/SIGNIFICANCE:** Exposure of melanin to ionizing radiation, and possibly other forms of electromagnetic radiation, changes its electronic properties. Melanized fungal cells manifested increased growth relative to non-melanized cells after exposure to ionizing radiation, raising intriguing questions about a potential role for melanin in energy capture and utilization.


Fungus eats radiation for breakfast at Chernobyl!





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Sarah Wallace, Matt Ford, ScienceGoGo and Jason Stajich comment on the fungus that gets its energy from radiation. I've heard of *Deinococcus radiodurans* before, but this is a fungus! Well, if there is an energy source to tap into, even if it is in the middle...

Melanized fungi use ionizing radiation for energy



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7251	10.1371/journal.pone.0000801	8/29/2007	2007	PLoS ONE	RA	Kinetic Analysis of Yersinia p	0	0	0	674	156	86	916	0	0	0
7252	10.1371/journal.pone.0000802	8/29/2007	2007	PLoS ONE	RA	TrpC3 Regulates Hypertrophy	4	0	6	894	311	77	1282	0	0	0
7253	10.1371/journal.pone.0000803	8/29/2007	2007	PLoS ONE	RA	Whole Blood Interferon-Gamr	2	0	4	1283	171	214	1668	0	0	0
7254	10.1371/journal.pone.0000804	8/29/2007	2007	PLoS ONE	RA	Detection of a MicroRNA Sign	2	4	7	2474	1008	103	3585	0	0	0
7255	10.1371/journal.pone.0000805	8/29/2007	2007	PLoS ONE	RA	Prevalence of Abnormal Radic	2	1	2	838	169	572	1579	0	0	0
7256	10.1371/journal.pone.0000806	8/29/2007	2007	PLoS ONE	RA	Primary Role of Functional Isc	3	3	6	1307	270	231	1808	0	0	0
7257	10.1371/journal.pone.0000807	8/29/2007	2007	PLoS ONE	RA	Wide-Scale Analysis of Huma	3	7	6	1661	377	82	2120	0	0	0
7258	10.1371/journal.pone.0000808	8/29/2007	2007	PLoS ONE	RA	Characterization of a Family o	1	1	2	603	112	25	740	0	0	0
7259	10.1371/journal.pone.0000809	8/29/2007	2007	PLoS ONE	RA	GAD1 mRNA Expression and	4	3	9	1022	339	46	1407	0	0	0
7260	10.1371/journal.pone.0000810	8/29/2007	2007	PLoS ONE	RA	Development of New Mouse L	2	3	8	1336	319	42	1697	0	0	0
7261	10.1371/journal.pone.0000811	8/29/2007	2007	PLoS ONE	RA	Host Transcript Accumulation	0	2	2	905	194	50	1149	0	0	0
7262	10.1371/journal.pone.0000812	8/29/2007	2007	PLoS ONE	RA	Insulin Resistance and Body F	4	0	5	1074	203	86	1363	0	0	0
7263	10.1371/journal.pone.0000813	8/29/2007	2007	PLoS ONE	RA	The Antibacterial Protein Lysc	2	1	1	2379	354	26	2759	2	0	0
7264	10.1371/journal.pone.0000814	8/29/2007	2007	PLoS ONE	RA	Distinguishing Functional Amir	0	1	1	729	144	40	913	0	0	0
7265	10.1371/journal.pone.0000815	8/29/2007	2007	PLoS ONE	RA	Locus-Specific Ribosomal RN	1	2	2	683	231	20	934	0	0	0
7266	10.1371/journal.pone.0000816	8/29/2007	2007	PLoS ONE	RA	A Sensitive Tg Assay or rHTS	1	0	0	992	84	587	1663	0	0	0
7267	10.1371/journal.pone.0000817	9/5/2007	2007	PLoS ONE	RA	Sp1 Expression Is Disrupted i	2	2	1	1095	168	99	1362	0	0	0
7268	10.1371/journal.pone.0000818	9/5/2007	2007	PLoS ONE	RA	CD100 on NK Cells Enhance If	2	0	2	602	182	10	794	0	0	0
7269	10.1371/journal.pone.0000819	9/5/2007	2007	PLoS ONE	RA	rs1004819 Is the Main Diseas	17	5	27	1035	255	116	1406	0	0	0
7270	10.1371/journal.pone.0000820	9/5/2007	2007	PLoS ONE	RA	Preference of Small Molecules	0	2	2	1022	178	317	1517	0	0	0
7271	10.1371/journal.pone.0000821	9/5/2007	2007	PLoS ONE	RA	Rapid Maturation of Effector T	0	0	0	456	88	6	550	0	0	0
7272	10.1371/journal.pone.0000822	9/5/2007	2007	PLoS ONE	RA	An Outbreak of Severe Infect	1	1	1	1363	297	21	1681	0	0	0
7273	10.1371/journal.pone.0000823	9/5/2007	2007	PLoS ONE	RA	Recognition of HIV-1 Peptides	1	1	1	776	211	22	1009	0	0	0
7274	10.1371/journal.pone.0000824	9/5/2007	2007	PLoS ONE	RA	Malaria in Africa: Vector Spec	3	4	4	2038	394	31	2463	1	0	0
7275	10.1371/journal.pone.0000825	9/5/2007	2007	PLoS ONE	RA	A Genetic Basis of Susceptib	4	2	5	1603	212	514	2329	0	0	0
7276	10.1371/journal.pone.0000826	9/5/2007	2007	PLoS ONE	RA	Impact of Antiretroviral Therap	4	1	4	1204	207	36	1447	0	0	0
7277	10.1371/journal.pone.0000827	9/5/2007	2007	PLoS ONE	RA	Arterial Response to Shear St	4	0	8	901	273	86	1260	0	0	0
7278	10.1371/journal.pone.0000828	9/5/2007	2007	PLoS ONE	RA	Regulation of Retention of Fos	0	0	0	793	223	11	1027	0	0	0
7279	10.1371/journal.pone.0000829	9/5/2007	2007	PLoS ONE	RA	Beringian Standstill and Spres	16	9	18	5024	1037	39	6100	0	0	0
7280	10.1371/journal.pone.0000830	9/5/2007	2007	PLoS ONE	RA	Divide and Conquer: Enriching	0	0	1	674	112	77	863	0	0	0
7281	10.1371/journal.pone.0000831	9/5/2007	2007	PLoS ONE	RA	Studying Seabird Diet through	4	1	8	1265	260	17	1542	1	0	0
7282	10.1371/journal.pone.0000832	9/5/2007	2007	PLoS ONE	RA	Polymorphisms within Novel R	18	8	28	956	319	75	1350	0	0	0
7283	10.1371/journal.pone.0000833	9/5/2007	2007	PLoS ONE	RA	Differential Requirements for I	2	3	3	834	193	6	1033	0	0	0
7284	10.1371/journal.pone.0000834	9/5/2007	2007	PLoS ONE	RA	Three Dimensional Imaging of	1	3	7	4795	1157	57	5000	0	0	0

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Journal Summary Usage Data

This page contains summary tables relating solely to article usage data. We have also provided [detailed text](#) describing the full range of article-level metrics at PLoS, [detailed information about usage data](#) in particular, and a [summary Excel file](#) containing the full data set.

Table of average lifetime usage per journal: mean values are shown per journal, per article type (Research Articles or non-Research Articles), according to the year of first publication

This table contains summary usage data for the articles published by each PLoS journal and provides an indication of the typical usage levels that might be expected, at a journal level, for those articles originally published in any given year. As an example of how to read this table, there were 238 non-Research Articles published in *PLoS Biology* in 2006 and as of 31st July 2009 their lifetime average usage was 2,600.

See [notes](#) at the bottom of this table.

	2006	2006	2007	2007	2008	2008

Evaluating the (usage) data

	2006	2006	2007	2007	2008	2008
	Non-Research Articles Avg (n)	Research Articles Avg (n)	Non-Research Articles Avg (n)	Research Articles Avg (n)	Non-Research Articles Avg (n)	Research Articles Avg (n)
<i>PLoS Biology</i>	2600 (238)	6400 (185)	4700 (118)	5600 (203)	3900 (131)	4200 (197)
<i>PLoS Clinical Trials</i>	4000 (15)	2700 (25)	1400 (9)	2000 (19)	n/a	n/a
<i>PLoS Computational Biology</i>	4700 (32)	3400 (136)	5200 (48)	2800 (203)	4900 (36)	2200 (251)
<i>PLoS Genetics</i>	3300 (35)	3800 (173)	3300 (20)	3400 (210)	2600 (27)	2400 (325)
<i>PLoS Medicine</i>	3700 (342)	5200 (145)	3300 (211)	5000 (135)	3200 (140)	6900 (110)
<i>PLoS Neglected Tropical Diseases</i>	n/a	n/a	2500 (16)	2100 (26)	1600 (46)	1700 (133)
<i>PLoS ONE</i>	n/a	n/a	n/a	2100 (1070)	n/a	1500 (2718)
<i>PLoS Pathogens</i>	3000 (26)	3500 (97)	2600 (25)	2700 (172)	2200 (15)	1900 (271)

Evaluating the (usage) data

PLoS Medicine

See [notes](#) at the bottom of this page.

	2006	2007	2008
Topic	Avg (n)	Avg (n)	Avg (n)
Cardiovascular Disorders	3300 (10)	5100 (8)	9300 (6)
Diabetes and Endocrinology	4600 (7)	6100 (13)	3200 (7)
Genetics and Genomics	4300 (29)	3300 (19)	3400 (13)
Immunology	3400 (31)	4100 (19)	2800 (8)
Infectious Diseases	5700 (69)	4700 (53)	4000 (36)
Neuroscience	5200 (9)	3700 (9)	5400 (5)
Non-Clinical Medicine	7400 (41)	7900 (18)	19600 (3)
Oncology	4500 (18)	4100 (17)	4600 (9)
Pediatrics and Child Health	4200 (10)	4000 (15)	4400 (10)
Public Health and Epidemiology	6000 (81)	5100 (77)	6600 (58)

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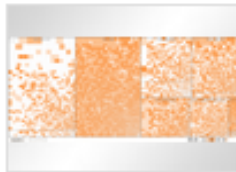
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Journals RA and non-RA Citations per Day matrix chart



Oct 19 2009

Journals RA and non-RA Citations per Day



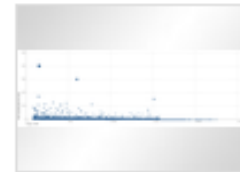
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PLoS article citations per day colored by publication year



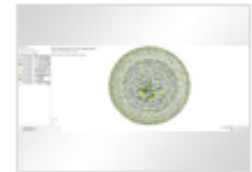
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Citation rate and article age



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PLoS article citations per day CrossRef and PubMed comparison



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Article citations per day grouped by journal and citation type

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Mike Chelen

Evaluating the data

Visualizations : PLoS article downloads per day

Uploaded by: **Mike Chelen**

Created at: Tuesday October 20 2009, 12:50 PM

Description:

Tags: **journal science plos**

Journal

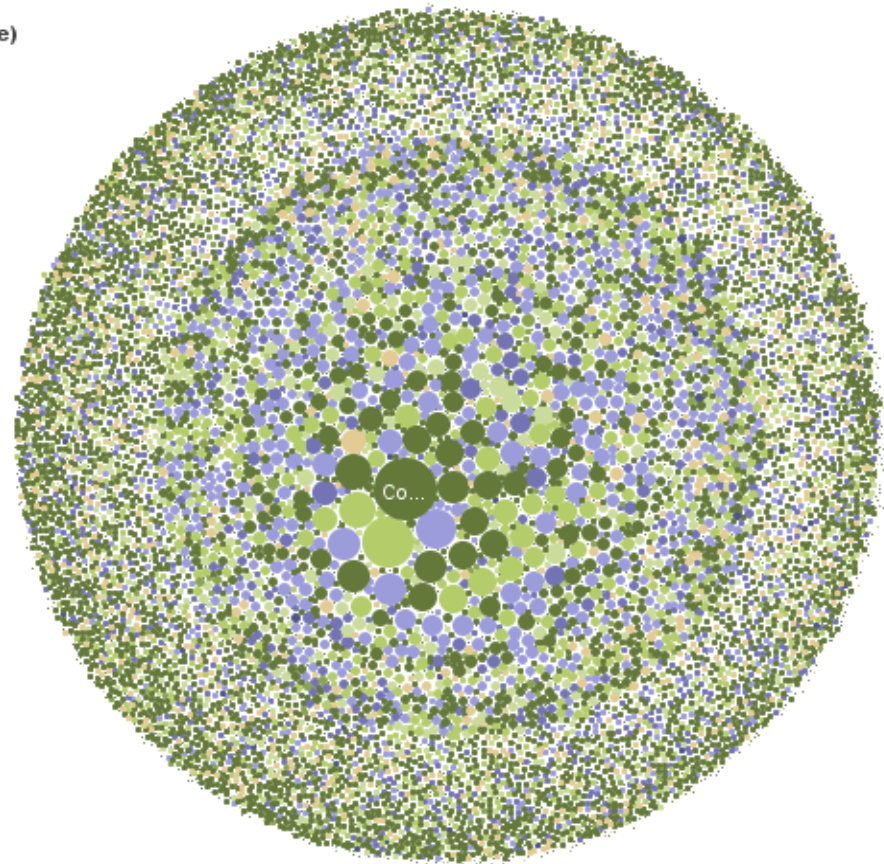
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- PLoS Biology
- PLoS Computational Biology
- PLoS Clinical Trials
- PLoS Genetics
- PLoS Medicine
- PLoS Neglected Tropical Diseases
- PLoS ONE
- PLoS Pathogens

PDF Downloads Per Day (aggregate)

Disks colored by Journal

Not shown: 1276 null/zero items



400
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Bubble Size PDF Downloads Per Day

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Evaluating the data

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Evaluating the data

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A Principal Component Analysis of 39 Scientific Impact Measures

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Johan Bollen^{1*}, Herbert Van de Sompel¹, Aric Hagberg^{2#},
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¹ Digital Library Research and Prototyping Team, Research Library, Los Alamos National Laboratory, Los Alamos, New Mexico, United States of America, ² Theoretical Division, Mathematical Modeling and Analysis Group, and Center for Nonlinear Studies, Los Alamos National Laboratory, Los Alamos, New Mexico, United States of America

Abstract [Top](#)

Background

The impact of scientific publications has traditionally been expressed in terms of citation counts. However, scientific activity has moved online over the past decade. To better capture scientific impact in the digital era, a variety of new impact measures has been proposed on the basis of social network analysis and usage log data. Here we investigate how these new measures relate to each other, and how accurately and completely they express scientific impact.

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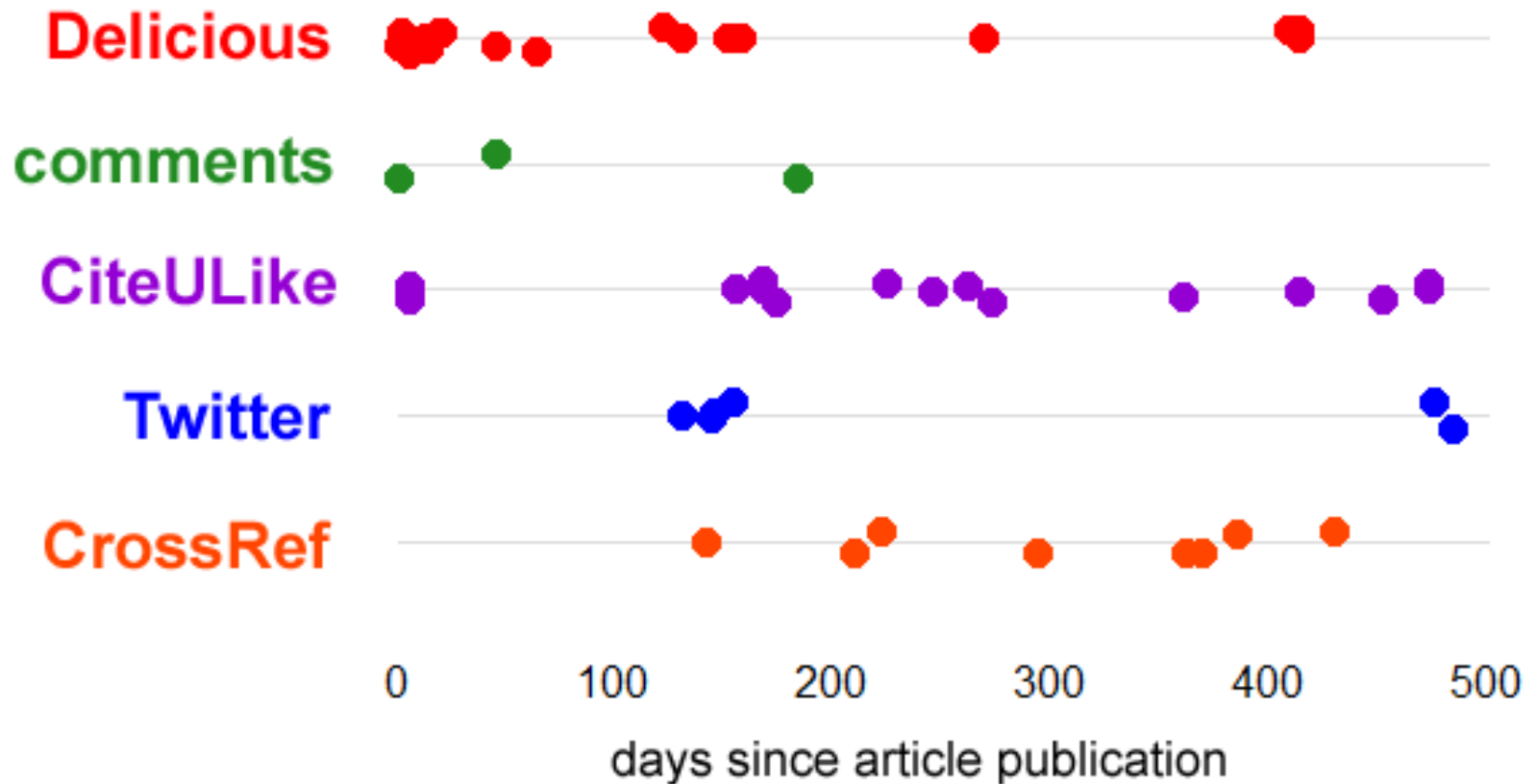
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Alt-metrics activity timelines

<http://dx.doi.org/10.1371/journal.pone.0006022>



Evaluating the (commenting) data

Plants Attract Parasitic Wasps to Defend Themselves against Insect Pests by Releasing Hexenol

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Correction

by Ilang (706)

In figure 3A, the first three comparisons, three-compound mixture (Z3Hol+TMTT+3Oxime) versus TMTT should be marked "ns" and this blend versus 3-methylbutanal oxime should be marked "***".

We declared that this error does not affect the conclusions of the article.

What kind of comment is this?

- Fragment or annotation
- Interpretation, analysis or journal club
- Request for clarification
- Direct criticism
- Comment from author
- Review, typo fix or correction
- Bonus links or citations
- Crazies
- Other

[see some examples](#)

3-methylbutanal

What kind of comment is this?

- Fragment or annotation
- Interpretation, analysis or journal club
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- Bonus links or citations
- Crazies
- Other

[see some examples](#)

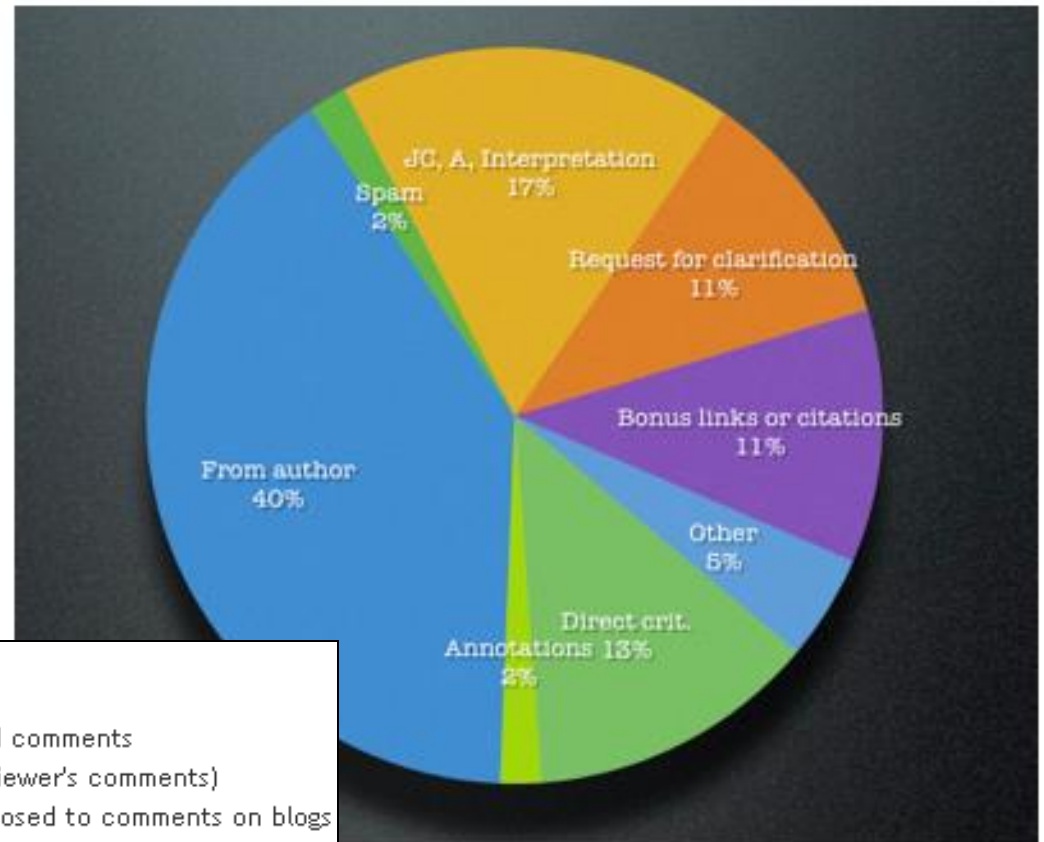
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Euan Adie

Evaluating the (commenting) data

Commenting breakdown



Summary

- 18% of PLoS ONE papers have reader or author submitted comments
- 39% if you count comments added by editors (usually reviewer's comments)
- Very few comments are of the 'omg, wow' variety (as opposed to comments on blogs)
- authors are responsible for a high percentage (~ 40%) of user submitted comments
- 17% of user submitted comments contain interpretation or journal club style precis
- 13% of user submitted comments are direct criticism
- 11% are direct questions or requests for clarification
- These %s are similar to [what we saw in the BMC dataset](#)
- The trackbacks protocol is inadequate for picking up blog chatter about papers

Extending Article Level Metrics



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Publication count	40
Citation Count	84
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1 [ACM's annual report](#)

Stuart I. Feldman

January 2009 **Communications of the ACM**, Volume 52 Issue 1

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2008

The Dirty War In for Examining a

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Article Usage ⓘ

Total Article Views: **425**

Breakdown by View Type

HTML Page Views: 3431

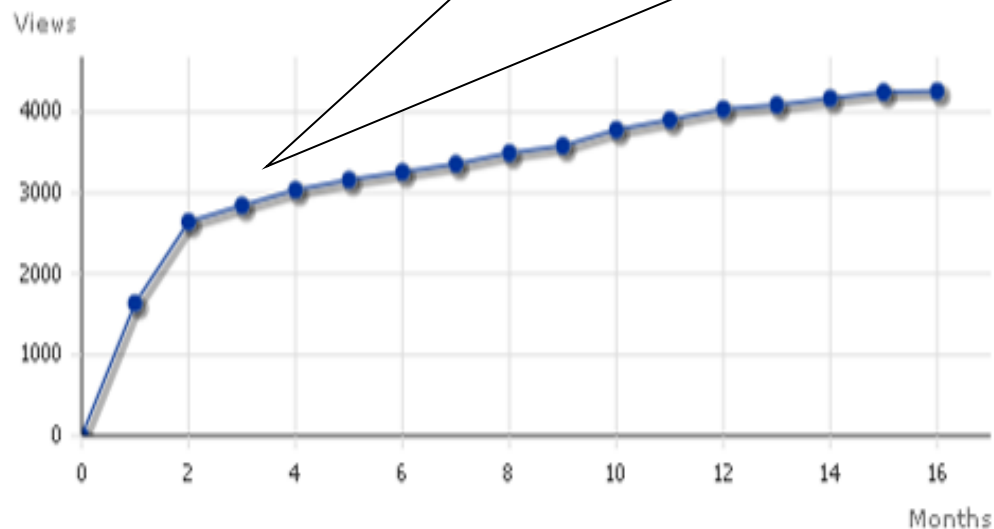
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“The Dirty War Index (DWI) method has been adapted for use in NATO military environments to monitor civilian, woman and child casualties. This version of the DWI is called a ‘Civilian Battle Damage Assessment Ratio’ (CBDAR).

Since October 2009, the CBDAR methodology has been used by NATO forces in Southern Afghanistan in order to reduce the possibility of injuring Afghan civilians. The methodology has identified a number of military activities that historically lead to civilian mortality that has led to NATO changing procedures.”

Cumulative Views from Dec 16, 2008 to Mar 3, 2010*



*Data refer to views from the PLoS Medicine Web site only

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- Expert analysis and tools
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- Develop and adhere to standards



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Alt-metrics: a manifesto

version 1 – released October 26, 2010

No one can read everything. We rely on filters to make sense of the scholarly literature, but the narrow, traditional filters are being swamped. However, the growth of new, online scholarly tools allows us to make new filters; these alt-metrics reflect the broad, rapid impact of scholarship in this burgeoning ecosystem. We call for more tools and research based on alt-metrics.

As the volume of academic literature explodes, scholars rely on filters to select the most relevant and significant sources from the rest. Unfortunately, scholarship's three main filters for importance are failing:

- Peer-review has served scholarship well, but is beginning to show its age. It is slow, encourages conventionality, and fails to hold reviewers accountable. Moreover, given that most papers are eventually published somewhere,

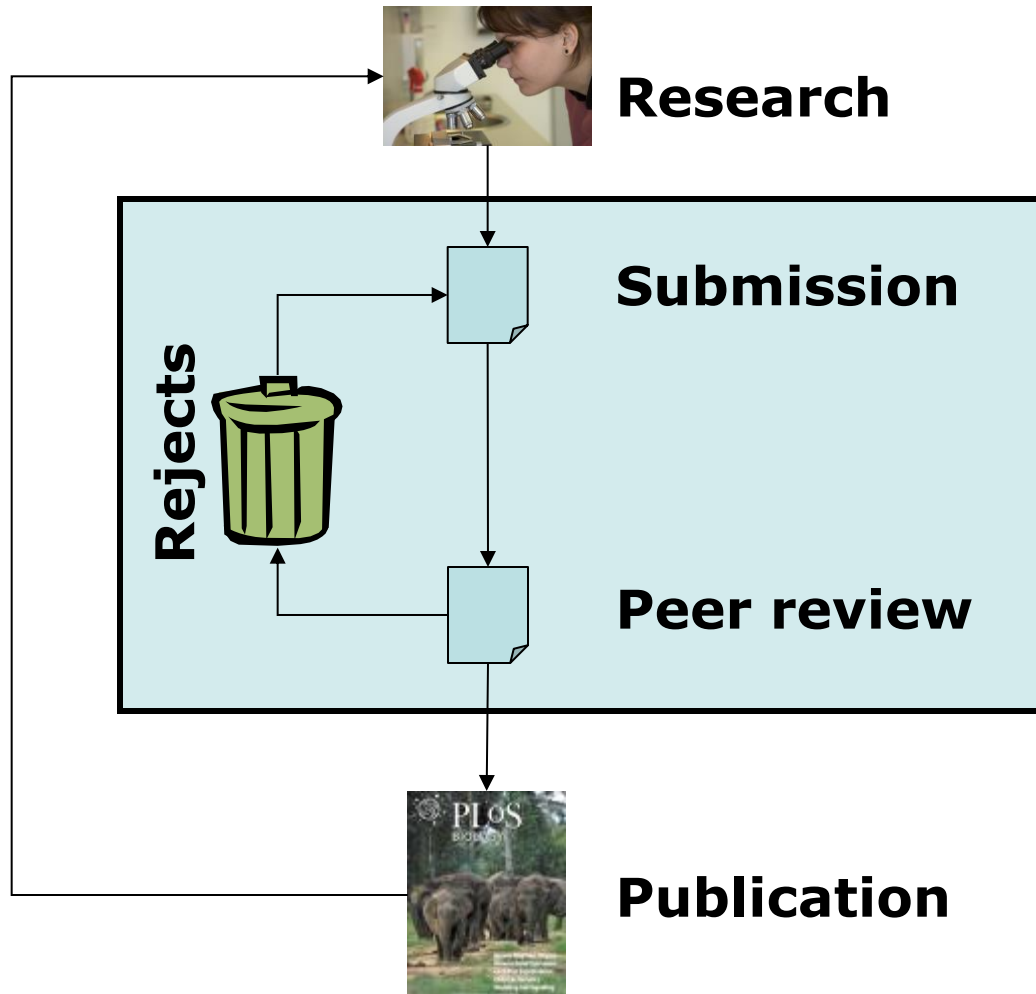
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Priem, Taraborelli, Groth, Neylon

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Good enough?
Right audience?
Takes months/years

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