

社交媒体分享学术论文的 影响力计量分析

浮现中的数字学术：
社交媒体与学术成果传播

2018.11.01
09:00-12:00
14:00-17:00

武汉大学
信息管理学院313会议室

王贤文
吴丹
余厚强
徐申萌
方志超
白洁

大连理工大学教授
武汉大学珞珈特聘教授
南京理工大学经济管理学院副教授
美国北卡罗来纳大学博士生
荷兰莱顿大学科学技术研究中心博士生
Digital Science中国区业务发展总监

王贤文

大连理工大学 科学学与科技管理研究所

WISE实验室

2018年11月

主办方：
武汉大学信息管理学院
武汉大学信息资源研究中心
《图书情报知识》编辑部
《信息资源管理学报》编辑部

协办：
媒体合作：壹字壹
北京大学出版社
人大数媒科技（北京）有限公司

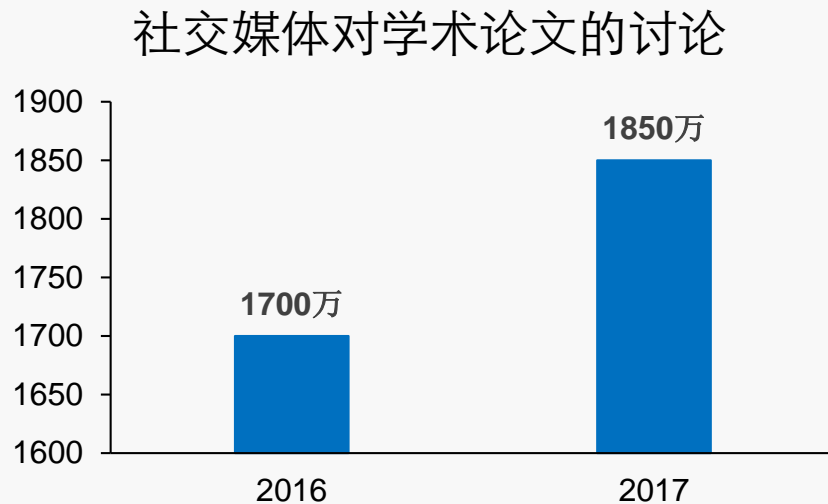


大连理工
Dalian University of

大学
Technology

社交媒体已经成为重要的学术交流平台

- 每年有将近2000万条社交媒体内容在讨论学术



- 讨论学术内容的社交媒体账号主体
 - 学术期刊
 - 论文作者、科学家同行
 - 科学记者
 - 社会公众

科学家参与社交媒体

- 许多科学家积极参与社交媒体，宣传论文、传播学术观点

David G. Rand
@DG_Rand

Prof of Management Science and Brain & Cognitive Science @MIT. Studying Cooperation; Intuition vs deliberation; Fake News/Misinformation; religion; signaling.

New Haven, CT
DaveRand.org
Joined June 2012

Tweets: 3,786 | Following: 1,954 | Followers: 5,940 | Likes: 2,518

Tweets | Tweets & replies | Media

Pinned Tweet
David G. Rand @DG_Rand · Oct 24
Out in @nature w @GordonKraftTodd: How can advocates best spread prosocial innovations (eg solar panels)? Adopt the innovations themselves-this communicates real belief in the benefits. Plus, empirical support for CREDS cultural evolution theory!

rdcu.be/9Zmn

Fig. 1 | Ambassadors who install solar panels through the Solarize programme are more successful at convincing others to participate than

Fig. 2 | Ambassador installation influences subjects' intentions to install through the Solarize programme. A. Scatter plot of intentions to install (1-7 Likert scale) as a function of whether or not the ambassador installed solar panels through the Solarize programme (Yes, n = 100 or did not (No), n = 100). C. Subjects' actual solar panel installation rates under the effect of ambassador (credibility-enhancing displays) promote the provision of non-normative public goods.

Promoting the adoption of public goods that are not yet widely accepted is particularly challenging. This is because most tools for increasing cooperation—such as reputation concerns and information about social norms—are typically effective only for behaviors that are commonly practiced, or at least generally agreed upon as being desirable. Here we examine how advocates can successfully promote non-normative (that is, rare or unpopular) public goods. We do so by applying the cultural evolutionary theory of credibility-enhancing displays, which argues that beliefs are spread more effectively by actions than by words alone—because actions provide information about the actor's true beliefs. Based on this logic, people who themselves engage in a given behaviour will be more effective advocates for that behaviour than people who merely vocalize a intention—specifically because engaging in a behaviour credibly signals a belief in its value. As predicted, a field study of a programme that promotes residential solar panel installation in 58 towns in the United States—comprising 1.4 million residents in total—found that community organizers who themselves installed through the programme recruited 62.8% more residents to install solar panels than community organizers who did not. This effect was replicated in three pre-registered randomized survey experiments.

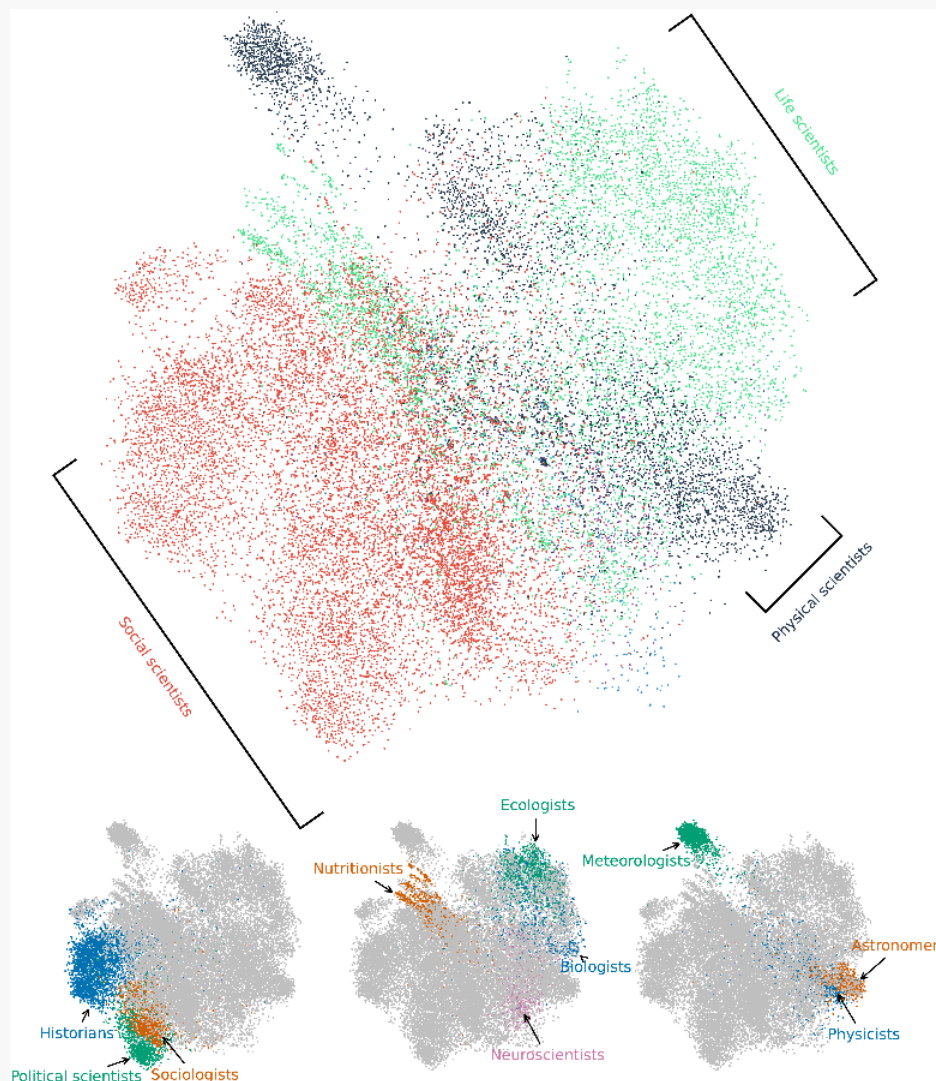
科学家参与社交媒体

- Twitter上科学家的学科统计

	学科	用户
1	历史学	3586
2	心理学	3579
3	物理学	2737
4	营养学	2510
5	政治科学	1441
6	计算机科学	1123
7	考古学	1100
8	生物学	1075
9	经济学	1044
10	社会学	1020

科学家参与社交媒体

- 科学家的Twitter关注网络



Ke, Q., Ahn, Y. Y., & Sugimoto, C. R. (2017). A systematic identification and analysis of scientists on Twitter. *PloS one*, 12(4), e0175368.

学术期刊参与社交媒体

- 学术期刊对发表论文的推广
- 推广手段
 - 传统方式：Email、RSS订阅
 - 新兴方式：社交媒体推广
- 学术期刊在Twitter / Facebook等平台建立社交媒体账户，分享知识、推广研究成果，包括自身发表的最新论文

学术期刊参与社交媒体

nature @nature

Tweets 8,578 Following 203 Followers 1.49M Likes 3,462 Lists 4

nature @nature

International weekly journal of science. Editorials, News & Views, corrections and primary research coverage here. For news, please see @NatureNews.

London

nature.com/nature/current...

Joined February 2012

Tweet to nature

1 Follower you know

3,266 Photos and videos

Tweets Tweets & replies Media

Pinned Tweet

nature @nature · Oct 24

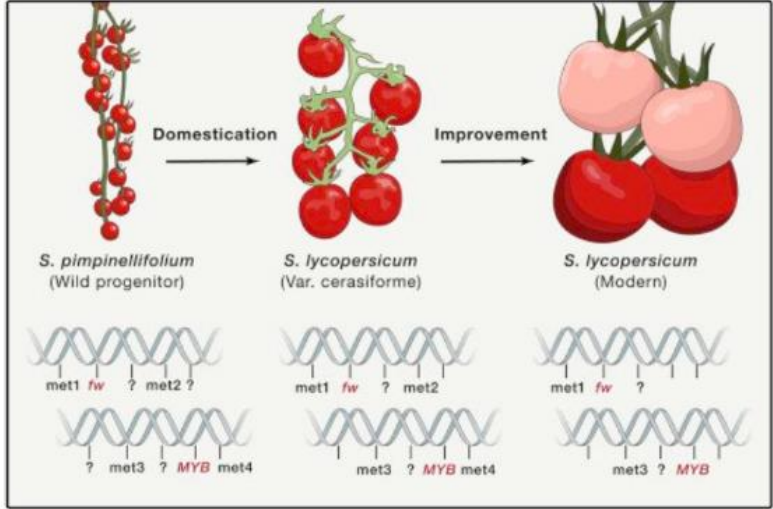
On the Nature cover this week: How early life shapes the infant gut microbiome and risk of disease go.nature.com/2CD3ovO



4 182 280

Cell at CellPress @CellCellPress · Jan 16

Analyses of #variation, #geneexpression & #metabolite accumulation in #ancestral, early #domesticates & modern #tomatoes identify #genes underlying fruit chemistry & show #alleles affecting metabolic quality were bred into modern fruits by #linkage drag. bit.ly/2AWyumm



S. pimpinellifolium (Wild progenitor) → *S. lycopersicum* (Var. *cerasiforme*) → *S. lycopersicum* (Modern)

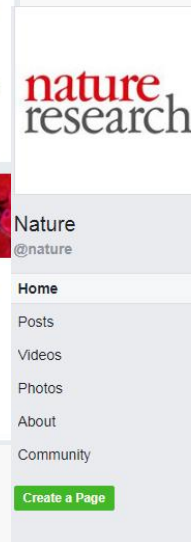
Genome labels: met1, fw, met2, met3, MYB, met4

1 17 33

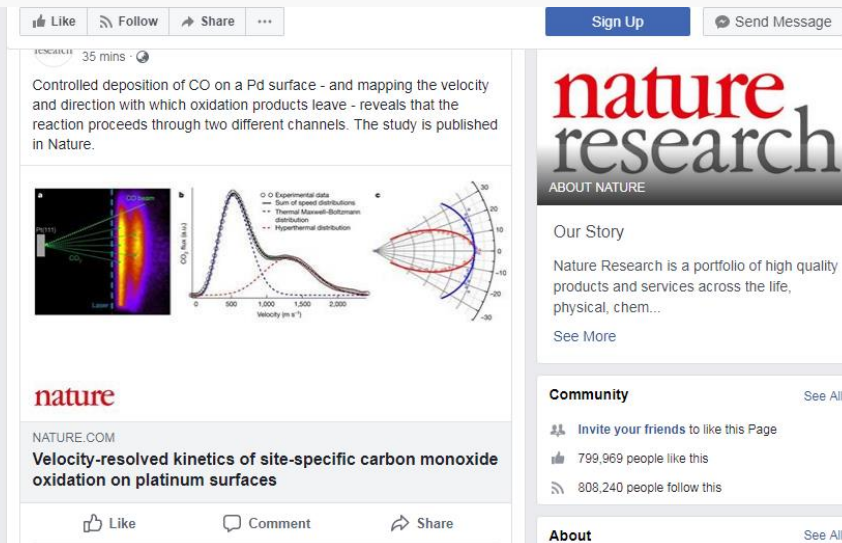
学术期刊参与社交媒体



Twitter



Facebook



植根于社交媒体的Altmetrics

- 越来越多的学术内容被越来越多的主体在社交媒体中讨论，对这一现象的研究催生Altmetrics
- 学术论文的热议能表征什么？热议意味着高被引吗？



植根于社交媒体的Altmetrics

- 学术论文的热议不一定能带来高被引，那么它能带来什么呢？
- **社会影响**
 - 社会公众
 - 科学家同行
- 社交网络分享的内容，人们会真的点进去看吗？
 - 出于礼貌只赞不看？
 - 出于人情只转不看？

社交媒体已经成为重要的学术导引工具

- 2016年Altmetric得分最高论文来自于：
- 美国总统 **奥巴马**

Altmetric TOP 100 ARTICLES 2016

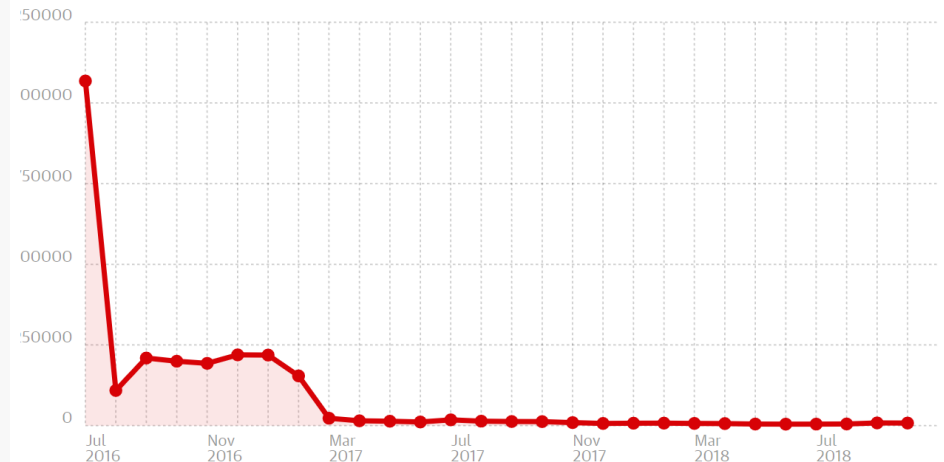
ARTICLE #1 OF 100
United States Health Care Reform: Progress to Date and Next Steps
SPECIAL COMMUNICATION IN JAMA

In the first academic paper to be published by a sitting president, Obama assesses the effect of the Affordable Care Act and recommends additional healthcare priorities for future governments.

315 news stories
45 blog posts
8,943 tweets
201 Facebook posts
2 peer reviews
14 Reddit posts
1 article on F1000
2 Wikipedia citations

Total Views	2,482,433 Pageviews
2,571,102	88,669 PDF Downloads

Since 7/1/2016



Special Communication

August 2, 2016

United States Health Care Reform Progress to Date and Next Steps

Barack Obama, MD¹

Author Affiliations | Article Information

JAMA. 2016;316(5):525-532. doi:10.1001/jama.2016.9797

Editorial
Comment

Related
Articles

Abstract

Importance The Affordable Care Act is the most important health care legislation enacted in the United States since the creation of Medicare and Medicaid in 1965. The law implemented comprehensive reforms designed to improve the accessibility, affordability, and quality of health care.

Objectives To review the factors influencing the decision to pursue health reform, summarize evidence on the effects of the law to date, recommend actions that could improve the health care system, and identify general lessons for public policy from the Affordable Care Act.

Evidence Analysis of publicly available data, data obtained from government agencies, and published research findings. The period examined extends from 1965 to 2016.

Findings The Affordable Care Act has made significant progress toward solving long-standing challenges facing the US health care system related to access,

Citations

186

Web of Science

Shares



- Picked up by 242 news outlets
- Blogged by 47
- Tweeted by 8019
- Mentioned by 2 peer review sites
- On 236 Facebook pages
- Referenced in 7 Wikipedia pages
- Mentioned in 50 Google+ posts

社交媒体已经成为重要的学术导引工具

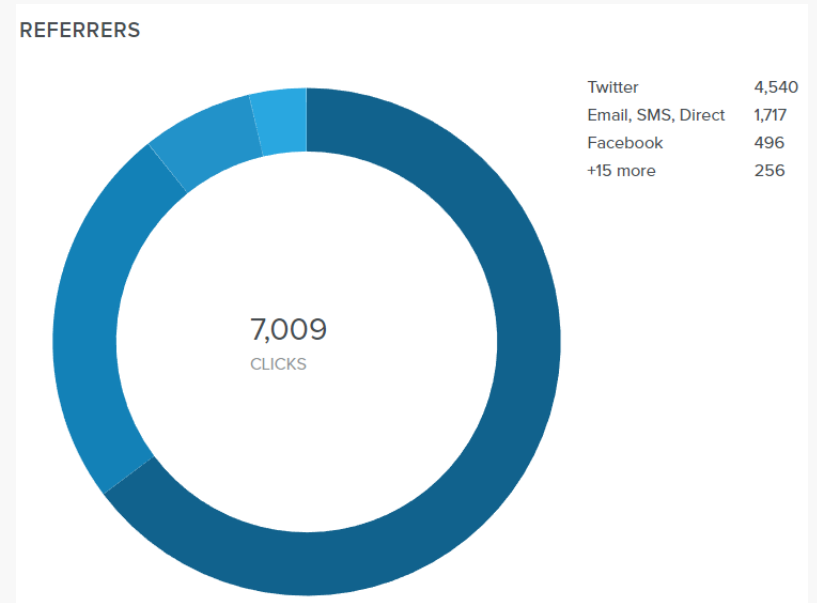
- 美国总统奥巴马论文的Twitter转发与论文点击

This article has 4613 twitter interactions across 5 URLs. It has received 2918 tweets and 1695 retweets.

2918 TWEETS 1695 RETWEETS

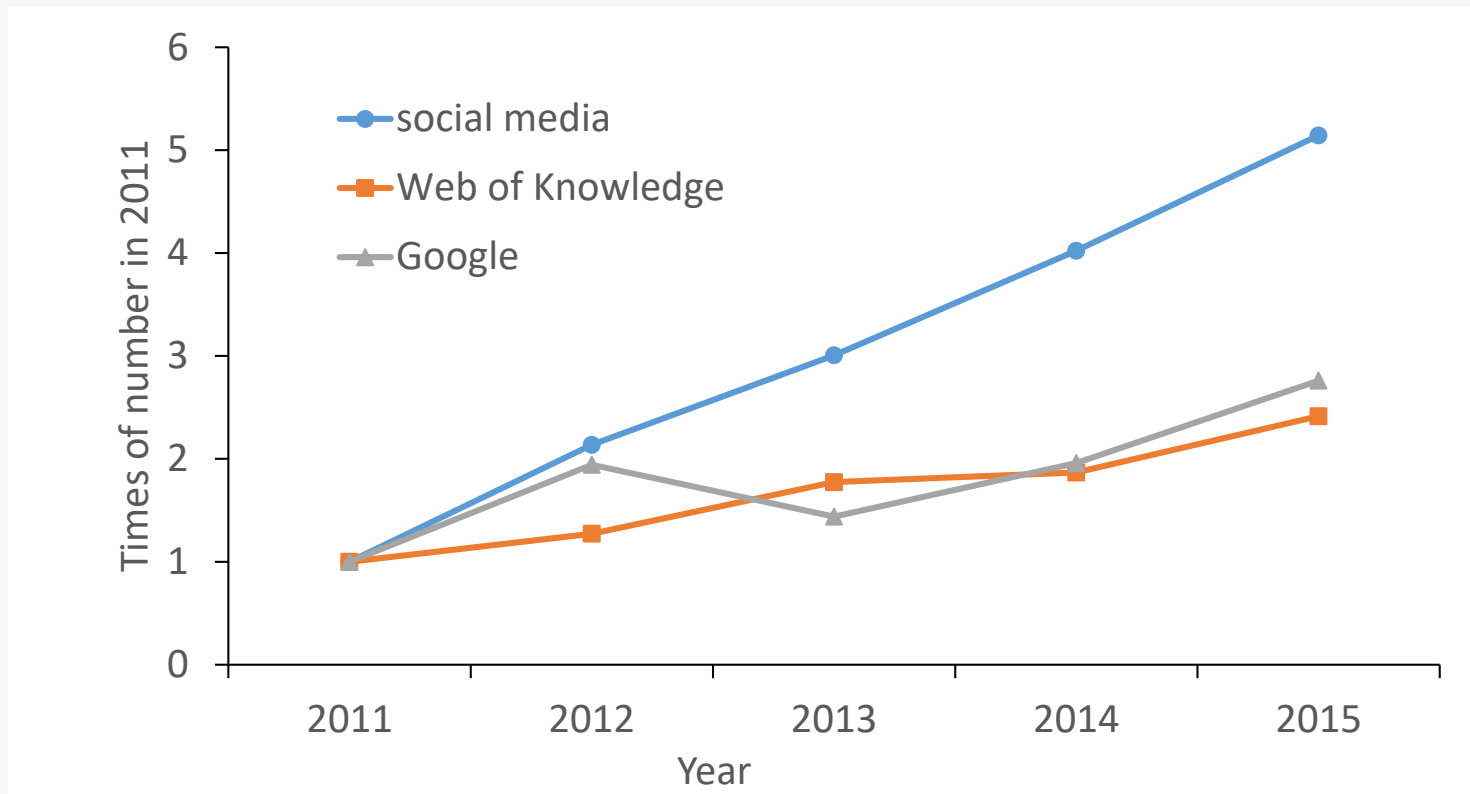


社交媒体转发附上全文链接的
许多短网址



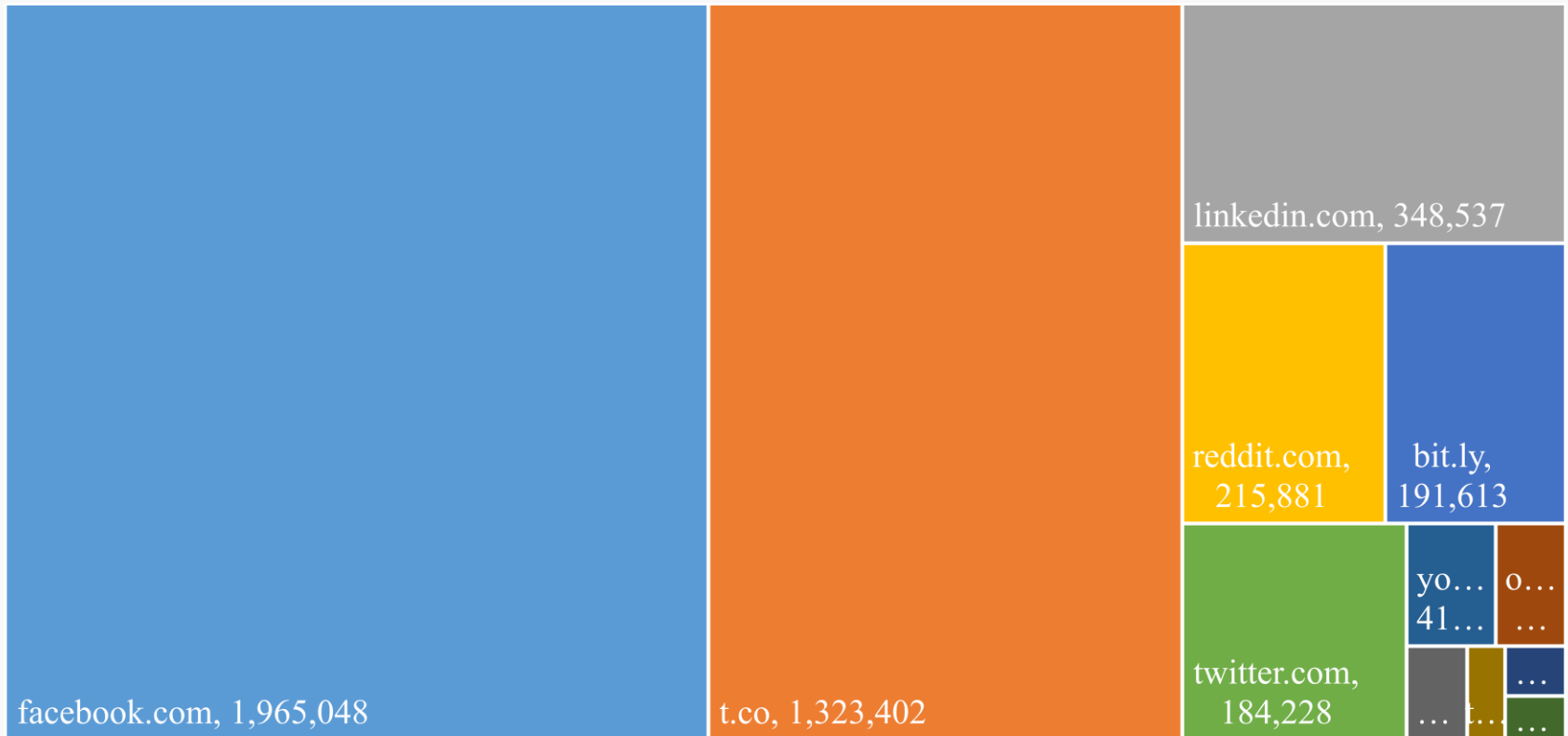
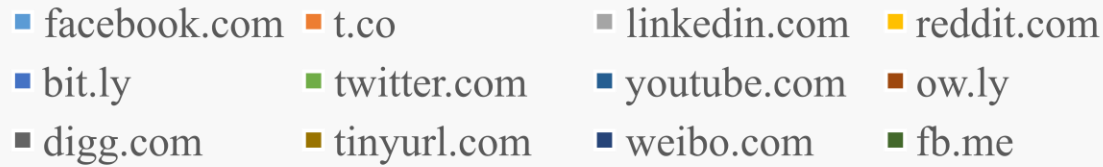
其中一个短网址的点击情况

社交媒体已经成为重要的学术导引工具



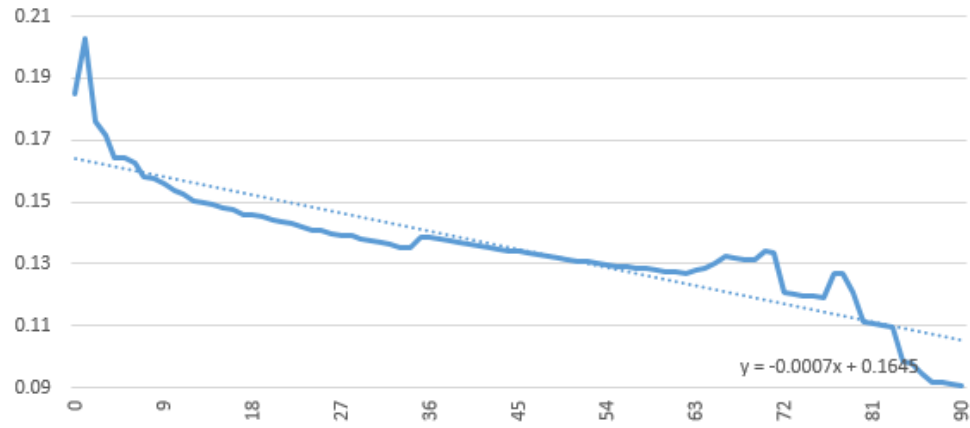
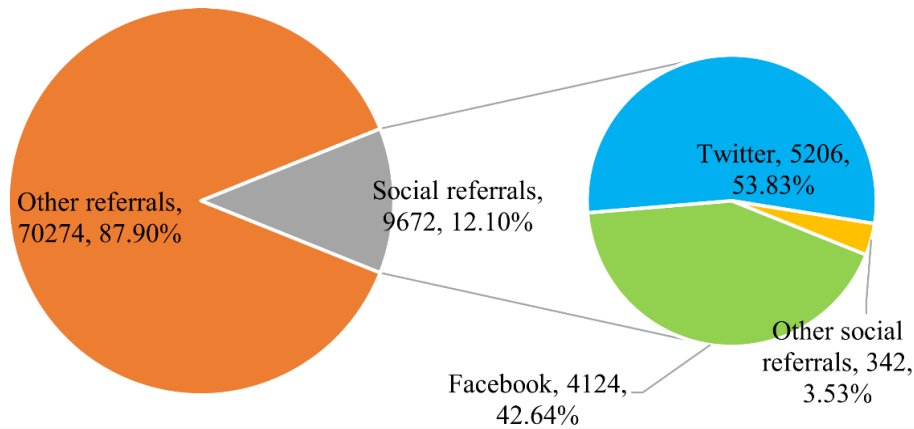
- 总量层面：社交媒体的学术导流增速迅猛（基于全部学术论文）

社交媒体已经成为重要的学术导引工具



- 总量层面：Facebook和Twitter是两个最大的导引来源

社交媒体已经成为重要的学术导引工具

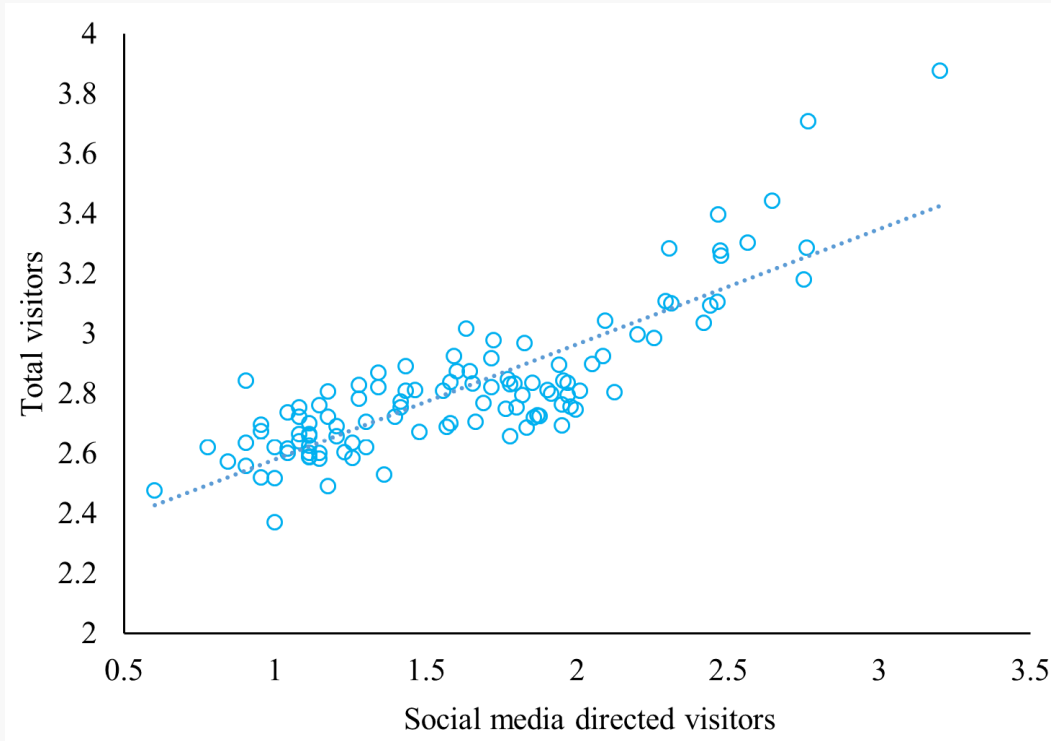


- 单篇论文层面：社交媒体的学术导流占比 **12%** +

- 社交媒体对学术论文的关注热情，来得快也去得快

Wang, X.*, Fang, Z., & Guo, X. (2016). Tracking the digital footprints to scholarly articles from social media. *Scientometrics*, 109(2), 1365-1376.

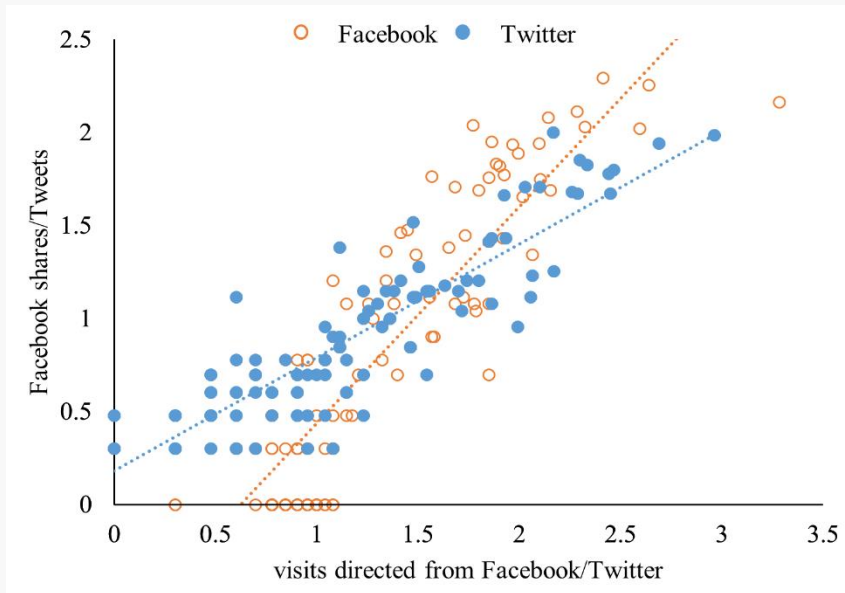
社交媒体已经成为重要的学术导引工具



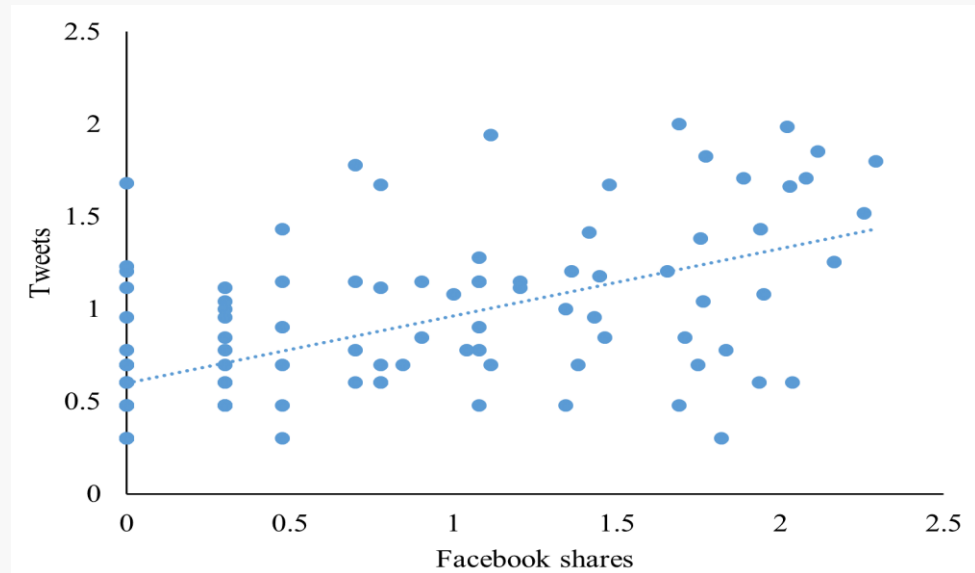
- 散点图：来自社交媒体的读者数与全部读者数
- 二者呈正相关关系

Wang, X.*, Wang, C., Li, Q., & Guo, X. (2017). Social media attention increases article visits: An investigation on article-level referral data of PeerJ. *Frontiers in Research Metrics and Analytics*, 10.3389/frma.2017.00011

社交媒体已经成为重要的学术导引工具

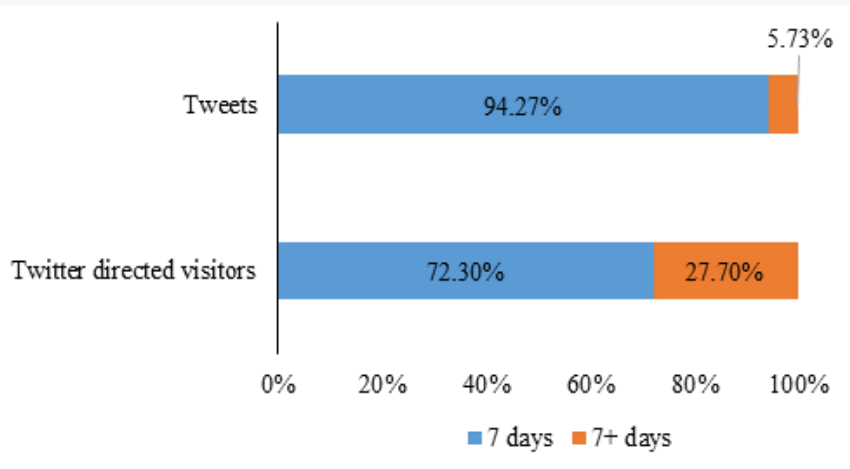


- 散点图：Facebook/Twitter转发与导引的读者数

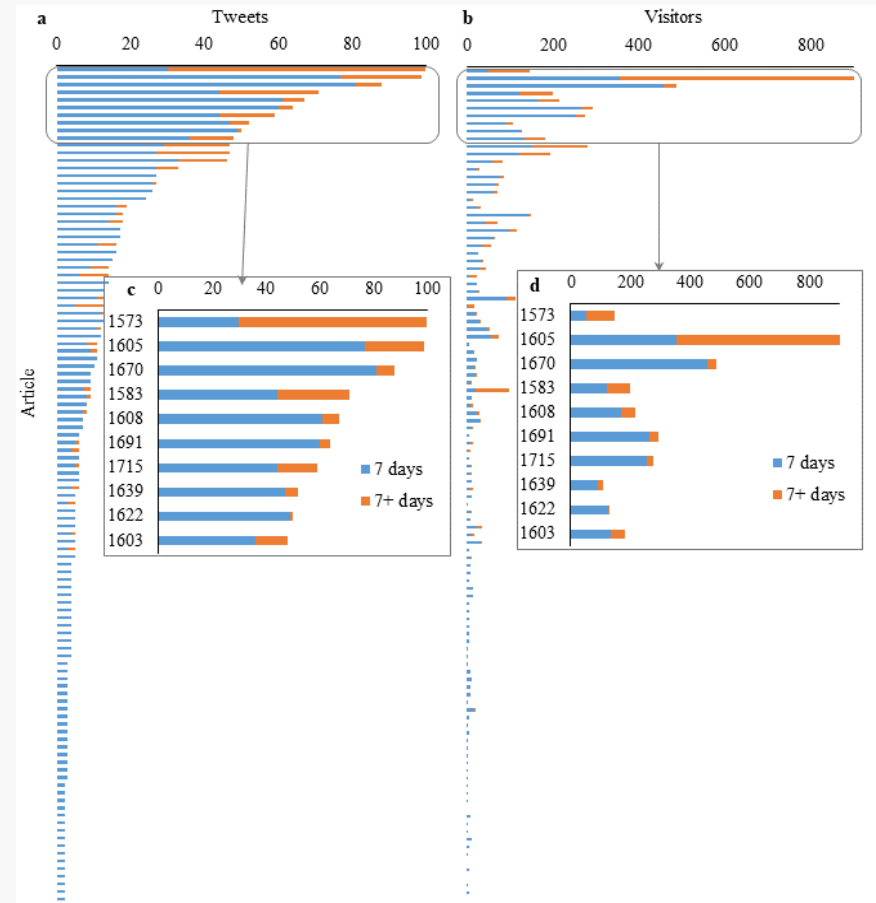


- 散点图：Facebook分享与Twitter转推

社交媒体已经成为重要的学术导引工具



- 论文受到的社交媒体关注主要集中在论文发表的一周以内



Wang, X.*, Wang, C., Li, Q., & Guo, X. (2017). Social media attention increases article visits: An investigation on article-level referral data of PeerJ. *Frontiers in Research Metrics and Analytics*, 10.3389/frma.2017.00011

学术期刊层面的社交媒体推广

- 研究对象
 - Cell 《细胞》：生命科学领域的权威国际期刊
 - Cell期刊会同时在Twitter和Facebook推广最新发表的学术论文
 - 两个平台发布相同的内容，配以相同的图片

Twitter

Cell Cell at CellPress @CellCellPress · Jan 16

Analyses of #variation, #geneexpression & #metabolite accumulation in #ancestral, early #domesticates & modern #tomatoes identify #genes underlying fruit chemistry & show #alleles affecting metabolic quality were bred into modern fruits by #linkage drag. bit.ly/2AWyimum

The diagram illustrates the genetic evolution of tomatoes. It shows three stages: 1. *S. pimpinellifolium* (Wild progenitor) with a cluster of small red fruits and DNA markers met1, fw, met2, and met3. 2. *S. lycopersicum* (Var. cerasiforme) after domestication, with larger fruits and markers met1, fw, and met2. 3. *S. lycopersicum* (Modern) after improvement, with very large, fleshy fruits and markers met1, fw, and MYB. Arrows labeled 'Domestication' and 'Improvement' connect the stages.

1 17 33

Cell January 16 ·

Analyses of #variation, #geneexpression & #metabolite accumulation in ancestral, early domesticates & modern #tomatoes identify genes underlying fruit chemistry & show alleles affecting metabolic quality were bred into modern fruits by #linkage drag. <http://bit.ly/2AWyimum>

The diagram illustrates the genetic evolution of tomatoes. It shows three stages: 1. *S. pimpinellifolium* (Wild progenitor) with a cluster of small red fruits and DNA markers met1, fw, met2, and met3. 2. *S. lycopersicum* (Var. cerasiforme) after domestication, with larger fruits and markers met1, fw, and met2. 3. *S. lycopersicum* (Modern) after improvement, with very large, fleshy fruits and markers met1, fw, and MYB. Arrows labeled 'Domestication' and 'Improvement' connect the stages.

Like Comment Share

136 Top Comments

58 Shares

Facebook

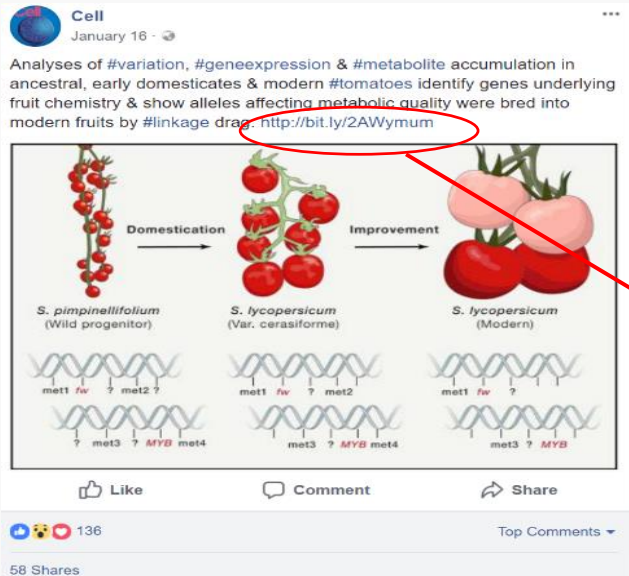
学术期刊层面的社交媒体推广

• 研究对象

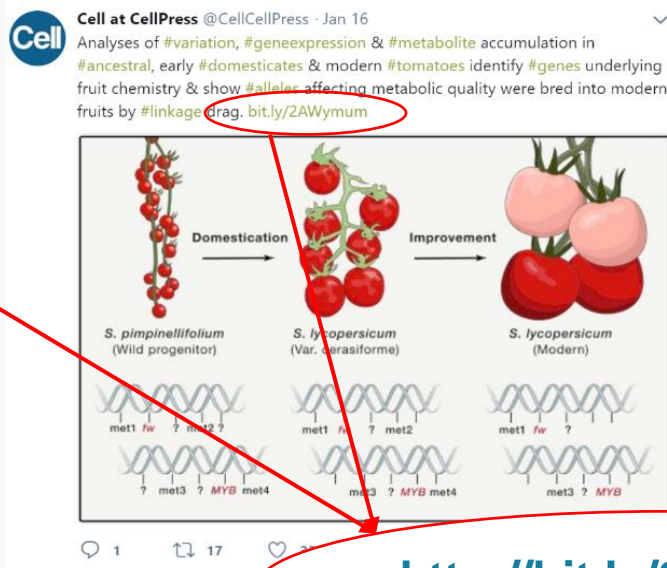
- Cell在2016-2018年的Po文，包括Twitter和Facebook
- Po文的社交媒体用户参与数据（点赞、转发）
- **Bitly短链接**的点击数据，<https://bitly.com/2AWymum+>



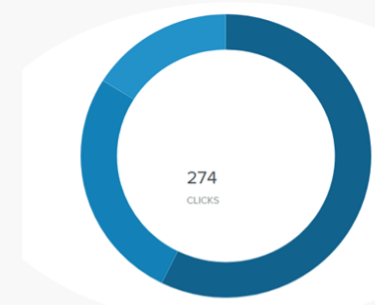
Facebook



Twitter



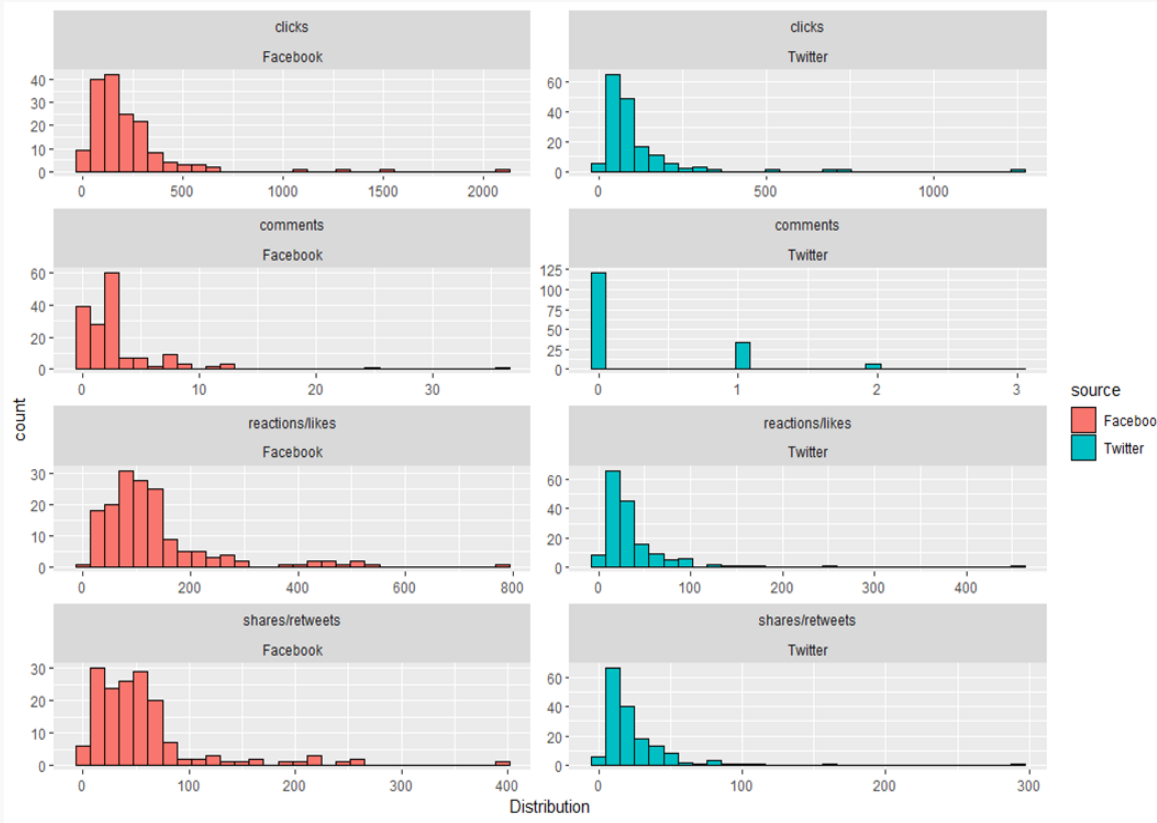
Bitly.com



<http://bit.ly/2AWymum+>

期刊层面的社交媒体推广

- 描述性统计：社交媒体参与



- 数据的偏态分布
- 大部分数据分布在横轴左边
- 大部分内容得到的关注分布在一个小的区间
- 只有少部分内容得到很大关注

Cui, Y., Wang, X., Xu, S., Hu, Z., & Zhang, C. (2018, September). Evaluating the influence of social media exposure of scholarly articles: Perspectives of social media engagement and click metrics. In *23rd International Conference on Science and Technology Indicators (STI 2018), September 12-14, 2018, Leiden, The Netherlands*. Centre for Science and Technology Studies (CWTS).

学术期刊层面的社交媒体推广

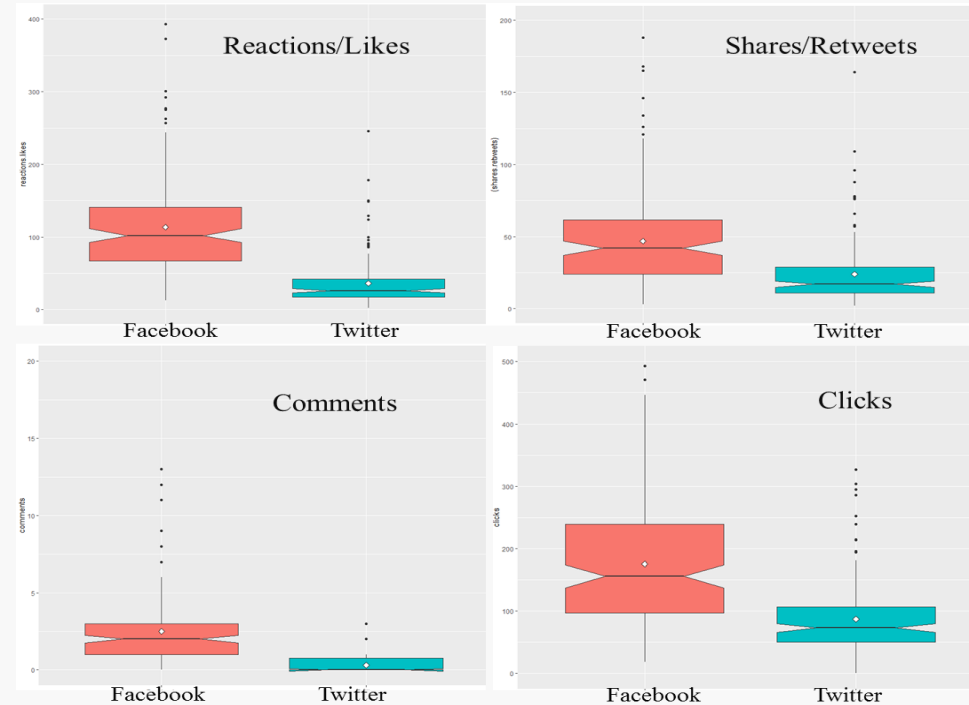
- 描述性统计：社交媒体参与

Facebook

	心情	转发	评论	点击
中位数	106	44	2	159
最大值	793	398	36	2113
最小值	13	3	0	18
模数值	113	50	0	156
标准差	115	57	4	249

Twitter

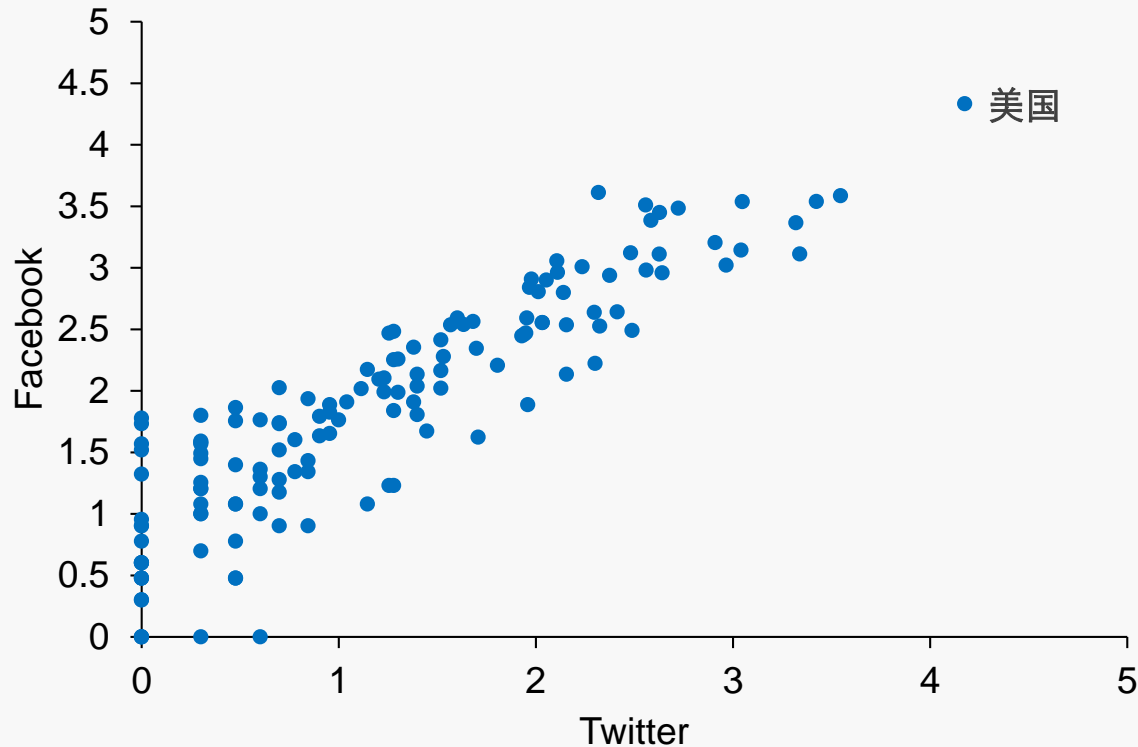
	点赞	转推	评论	点击
中位数	26	17.5	0	74
最大值	458	294	3	1251
最小值	2	2	0	0
模数值	20	10	0	55
标准差	47	30	0.58	132



期刊在Facebook上的社交媒体宣传，能取得比Twitter更好的效果

学术期刊层面的社交媒体推广

- 点击者地理分布的相关性



- Twitter转推用户多的国家，Facebook分享得也多

Cui, Y., Wang, X., Xu, S., Hu, Z., & Zhang, C. (2018, September). Evaluating the influence of social media exposure of scholarly articles: Perspectives of social media engagement and click metrics.

In *23rd International Conference on Science and Technology Indicators (STI 2018), September 12-14, 2018, Leiden, The Netherlands*. Centre for Science and Technology Studies (CWTS).

- Twitter与Facebook用户的交叉对比
 - 同一论文的Retweet和Facebook share用户的交叉对比
 - 验证是否同一用户既在Twitter转推，又在Facebook转发
 - 检验Twitter与Facebook的影响是否存在重叠？
 - 抑或Twitter的点赞与click都只是Facebook的子集？
 - 仅有不到5%的用户重叠
 - 说明在Twitter和Facebook两个平台上，社交媒体宣传影响的是**不同的用户群体**

Cui, Y., Wang, X., Xu, S., Hu, Z., & Zhang, C. (2018, September). Evaluating the influence of social media exposure of scholarly articles: Perspectives of social media engagement and click metrics.

In *23rd International Conference on Science and Technology Indicators (STI 2018)*, September 12-14, 2018, Leiden, The Netherlands. Centre for Science and Technology Studies (CWTS).

学术期刊层面的社交媒体推广

- 回归分析

$$\log(Y) = \beta_0 + \sum_{j=1}^p \beta_j \log(X_j)$$

Regression analysis of Facebook

	Coefficients	Exp	Std. Error	t value	P (> t)
Intercept	1.482***	4.402	0.296	5.000	1.5e-06
Log(Reactions)	0.498***	1.646	0.138	3.613	0.00049
Log(Shares)	0.346***	1.414	0.115	3.024	0.003

Regression analysis of Twitter

	Coefficients	Exp	Std. Error	t value	P (> t)
Intercept	2.156***	8.634	0.172	12.538	<2e-16
Log(Likes)	0.265**	1.303	0.108	2.450	0.015
Log(Retweets)	0.448***	1.566	0.109	4.118	6.17e-05

Cui, Y., Wang, X., Xu, S., Hu, Z., & Zhang, C. (2018, September). Evaluating the influence of social media exposure of scholarly articles: Perspectives of social media engagement and click metrics. In *23rd International Conference on Science and Technology Indicators (STI 2018), September 12-14, 2018, Leiden, The Netherlands*. Centre for Science and Technology Studies (CWTS).

学术期刊层面的社交媒体推广

- 学术论文的社交媒体暴露会增加论文的点击数量
- Facebook平台的提升作用大于Twitter平台
 - Altmetrics Attention Score的FB数据量很少
- Twitter和Facebook的受众地区存在较大的相关性
- Twitter和Facebook两个平台的受众不存在重叠，期刊在两个平台上的社交媒体宣传影响的是不同的受众群体
- 两个平台的点赞和转发都会增加论文的点击

一些思考的问题

- 谁在论文的社交媒体传播中发挥最重要的作用？
 - 学者、期刊、科学记者、公众？
- 不同期刊的社交媒体宣传策略，哪种更为有效？
 - 期刊组团宣传(Springer、Elsevier)还是单打独斗 (Nature) ？
- 传播的系统动力学： 阻断谣言的病毒式传播VS促进学术内容的传播
- 对中国的影响
 - 日本、韩国、巴西、西班牙、俄罗斯都能登陆国际社交媒体平台，这些国家的学者参与社交媒体的情况如何？
 - ResearchGate、Mendeley没有访问障碍，中国学者的参与程度如何？
- 参与中国社交媒体的情况
 - 微博、微信、科学网
 - 中国学者对待社交媒体的态度？
 -



谢 谢

请不吝指正

王贤文

大连理工大学 科学学与科技管理研究所

WISE实验室

2018年11月