

Review

Social Media Research, Human Behavior, and Sustainable Society

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Academic Editor: Paul Burger

Received: 23 January 2017; Accepted: 28 February 2017; Published: 6 March 2017

Abstract: A bibliometric analysis was conducted to review social media research from different perspectives during the period of 2008–2014 based on the Science Citation Index and Social Science Citation Index database. Using a collection of 10,042 articles related to social media, the bibliometric analysis revealed some interesting patterns and trend of the scientific outputs, major journals, subject categories, spatial distribution, international collaboration, and temporal evolution in keywords usage in social media studies. The research on social media has been characterized by rapid growth and dynamic collaboration, with a rising number of publications and citation. Communication, Sociology, Public, Environment & Occupational Health, Business, and Multidisciplinary Psychology were the five most common categories. *Computers in Human Behavior* was the journal with the most social media publications, and *Computers & Education* ranked first according to the average citations. The two most productive countries were the U.S. and UK, delivering about half of the publications. The proportion of China's internationally collaborative publications was the highest. The University of Wisconsin, the University of Michigan, and Harvard University were three most productive institutions. Several keywords, such as “Facebook”, “Twitter”, “communication”, “Social Networking Sites”, “China”, “climate change”, “big data” and “social support” increasingly gained the popularity during the study period, indicating the research trends on human behavior and sustainability.

Keywords: bibliometric analysis; social media; collaboration; human behavior; sustainable society

1. Introduction

Social media platforms are computer-mediated tools that allow people to create, share, or exchange information, career interests, ideas, pictures, and videos in virtual communities and networks. Social media can be defined as “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content” [1]. Social media is best understood as a group of new kinds of online media that share most or all of the following characteristics: participation, openness, conversation, community, and connectedness. There are basically six kinds of social media including social networks, blogs, wikis, podcasts, forums, content communities, and microblogging [2].

Social media has been evolving and providing world-wide users with information related to the people and events that matter to them. Social media has not only become an indispensable part of our daily lives but also enormously affected global economy and politics.

Since Mayfield [2] put forward the concept of social media and discussed it systematically, many studies have elucidated the various perspectives of this research field, such as social media users' motivations and personality [3–7], social media usage during disasters [8,9], management on social media sites [10], social media and political engagement [11], social media's impact on business [12–14], predicting elections, depression, flu pandemic [15–17], social media in higher education [18], and social media use among teens and young adults [19].

Although lots of review has been done in the field of social media from the perspective of tourism and hospitality [20], sales process [21], communication [22,23], emergency management [24], higher education [25], and E-government [26], there is still a lack of general overview that can reveal the holistic trend of social media research. Bibliometrics can be used to provide quantitative analysis of literature [27].

Bibliometrics refers to visual and quantitative analytics that are used to summarize trends in selected research fields [28,29]. Bibliometric analyses can reveal temporal dynamics of scholarly outputs, spatial and institutional distributions of publications, scientific collaborations, and major research directions [30–32]. The traditional bibliometric methods usually focus on the citation and content analysis. The emerging bibliometric network analysis often analyzes the relationships among keywords, country, research institute, and author. The common network analysis includes co-word analysis [33–35], co-citation analysis [36,37], co-authorship analysis [38–40], and co-publication analysis [41]. Many disciplines have used bibliometric methods to explore the impact of research themes, such as natural science, engineering, business, social sciences, and humanities [42–46]. However, bibliometric studies have not been performed on the comprehensive social media research literature.

The purpose of this bibliometric study is to analyze the SCI/SSCI scientific literatures on Social Media from 2008 to 2014 by examining the scientific outputs, source titles, science categories, geographical distribution of the authors, international collaborations, and temporal development of keyword frequencies. This study can promote social media research and help researchers in this rapidly growing field.

2. Data and Methods

The database was built to use the SCI and SSCI publications on social media. The SCI and SSCI databases are most commonly used for bibliometric studies [47]. We employed the search term "social media". Our bibliographic search resulted in 13,350 social media related publications from the SCI and SSCI databases. Only 10,042 of these papers were reserved after eliminating those without keywords. Then information about each publication was extracted, such as author name and affiliation, subject category, journal name, publication type, publication year, and key words.

The emphasis of the discussion below was to describe global scientific production on social media research from following aspects:

- (1) Growth of output during 2008–2014;
- (2) Distribution of output in subject categories and journals identified by ISI;
- (3) Geographic and institutional distribution of publications;
- (4) Distribution of author keywords analysis;
- (5) Institution collaboration network analysis.

3. Results and Discussion

3.1. Characteristics of Article Outputs

Ten thousand and forty-two publications were identified as being social media-related during 2008–2014. The characteristics of article outputs are shown in Figure 1 and Table 1. The annual publications raised from 716 in 2008 to 2509 in 2014, illustrating the dramatic rise and upward

development of social media research in the past seven years. It is concluded that the annual growth rate of publications obviously accelerated since 2010 through further analysis, and all the annual growth rates except 2008 and 2009 exceeded 20%. Meanwhile, the average annual growth rate of all SCI and SSCI publications was less than 5%.

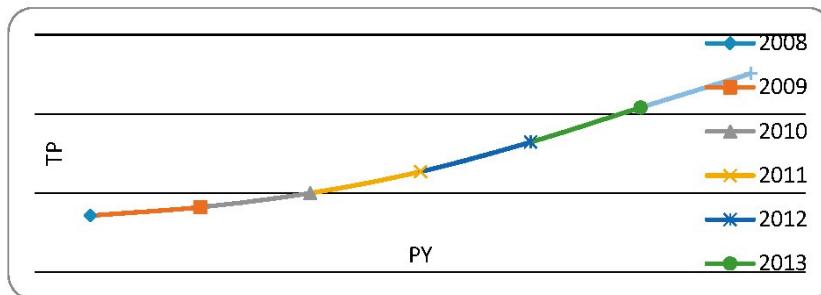


Figure 1. The growth of publication outputs. (PY: year; TP: total of publications).

The average number of authors and references increased from 2.79 and 41.99 in 2008 to 3.03 and 48.62 in 2014, respectively. The growth of references indicated that the accumulation of knowledge about social media has been expanding. However, an interesting fact is the average pages of a paper decreased from 14.97 in 2008 to 14.09 in 2014.

Table 1. Scientific outputs descriptors during 2008–2014.

PY	TP	AU	AU/TP	TC	TC/TP	NR	NR/TP	PG	PG/TP
2008	716	1996	2.79	8848	12.36	30,067	41.99	10,719	14.97
2009	823	2080	2.53	8580	10.43	34,692	42.15	12,001	14.58
2010	1000	2755	2.76	10,510	10.51	48,725	48.73	15,012	15.01
2011	1271	3351	2.64	8540	6.72	59,540	46.85	18,508	14.56
2012	1643	4597	2.80	7730	4.70	79,657	48.48	23,716	14.43
2013	2080	6133	2.95	4846	2.33	100,807	48.46	30,149	14.49
2014	2509	7605	3.03	1661	0.66	121,999	48.62	35,348	14.09
total	10,042	28,517	—	50,715	—	475,487	—	145,453	—
average	1434.6	4073.9	2.80	7245	6.80	67,926.7	46.50	20,779	14.60

PY: year; TP: number of publications; AU: number of authors; TC: total citation count; NR: number of cited references; PG: page count; AU/TP, PG/TP, NR/TP, and TC/TP: average of authors, pages, references, and citation in a paper.

3.2. Subjective Categories and Major Journals

10,042 social media publications involved 221 ISI-defined subject categories. The top 20 subject categories were presented in Table 2. The five most common categories were Communication (1439 papers; 14.33% of the total publications), Sociology (829; 8.26%), Public, Environment & Occupational Health (735; 7.32%), Business (627; 6.24%), and Psychology, Multidisciplinary (575; 5.73%). Communication was far above any other categories and had the fastest annual growth rate. Articles belonging to top five categories covered 41.88% of the total articles, while articles from the top 20 categories covered 91.79%. This result illustrated that social media research related to a wider range of disciplines, but its studies were mainly from these 20 categories, especially the top five categories.

These 10,042 social media articles that were published during 2008–2014 appeared in 2360 ISI-indexed journals. The top 10 productive journals were summarized in Table 3, and two of them were indexed by SCI, while nine journals were indexed by SSCI. These 10, or 0.42% out of the 2360 journals, had published 11.34% of the total articles. *Computers in Human Behavior* ranked first and published 236 articles on social media. *New Media & Society* published the second most articles (145), followed by *Public Relations Review* (133), *Information Communication & Society* (130), *The Journal of Medical Internet Research* (107), *Media Culture & Society* (92), *Comunicar* (85), *The Journal of Business Ethics*

(83), *American Behavioral Scientist* (74), and *Computers & Education* (55). Social media articles that were published in these journals received, on average, 6.61 citations. Most of these 10 journals belong to communication and sociology. Among these 10 journals, *Computers & Education* had average citations of 13.44, and an IF of 2.63, ranked first and second, respectively.

Table 2. Distribution of the subject categories: the top 20.

SCI/SSCI Subject Category	TP (%)
Communication	1439 (14.33)
Sociology	829 (8.26)
Public, Environmental & Occupational Health	735 (7.32)
Business	627 (6.24)
Psychology, Multidisciplinary	575 (5.73)
Information Science & Library Science	563 (5.61)
Education & Educational Research	551 (5.49)
Computer Science, Information Systems	537 (5.35)
Management	479 (4.77)
Social Sciences, Interdisciplinary	429 (4.27)
Psychiatry	335 (3.33)
Psychology, Experimental	274 (2.73)
Psychology, Clinical	269 (2.68)
Environmental Studies	255 (2.54)
Political Science	233 (2.32)
Linguistics	231 (2.30)
Environmental Sciences	222 (2.21)
Geography	213 (2.12)
Cultural Studies	211 (2.10)
Health Care Sciences & Services	211 (2.10)
Sub Total	9218 (91.79)

TP: number of publications; %, the percentage of the subject in the study field.

Table 3. The 10 most active journals in social media research.

Journals	TP (%)	TC (%)	TC/TP	IF
<i>Computers in Human Behavior</i>	236 (2.35)	1786 (3.52)	7.57	2.273
<i>New Media & Society</i>	145 (1.44)	1220 (2.41)	8.41	2.052
<i>Public Relations Review</i>	133 (1.32)	794 (1.57)	5.97	0.755
<i>Information Communication & Society</i>	130 (1.29)	629 (1.24)	4.84	1.283
<i>Journal of Medical Internet Research</i>	107 (1.07)	764 (1.51)	7.14	4.669
<i>Media Culture & Society</i>	92 (0.92)	361 (0.71)	3.92	1.139
<i>Comunicar</i>	85 (0.84)	73 (0.14)	0.86	0.35
<i>Journal of Business Ethics</i>	83 (0.83)	665 (1.31)	8.01	1.552
<i>American Behavioral Scientist</i>	74 (0.74)	438 (0.86)	5.92	0.926
<i>Computers & Education</i>	55 (0.55)	739 (1.46)	13.44	2.63
Total	1140 (11.34)	7469 (14.73)		
Average			6.61	1.76

TP: number of publication; TC: total citation count; TC/TP: average of citations in a paper; IF: ISI Impact factor.

3.3. Geographic and Institutional Distribution of Publications

The geographic and institutional distributions of publications were generated based on the affiliation information of authors. We summarized the 10 most productive countries in Figure 2, in terms of the number of total publications, single country articles and international collaborations, respectively. Out of these 10 countries, 7 were from Europe, 1 was from North America, 1 was from Oceania, and 1 was from Asia.

The most productive country was the U.S., owning the most single-country (2810) and international collaborative articles (817). The UK published the second largest number of articles

(1328). 4955 articles were published by authors from these two countries, accounting for 49.88% of the total 10,042 articles. The proportion of China's internationally collaborative publications was the highest (49.79%). Moreover, it is interesting that Australia was the third most productive. A possible explanation for this is that social media is extraordinarily popular in Australia. According to the Australia Social Media Report 2010, Australia leads the world in average time spent on social media.

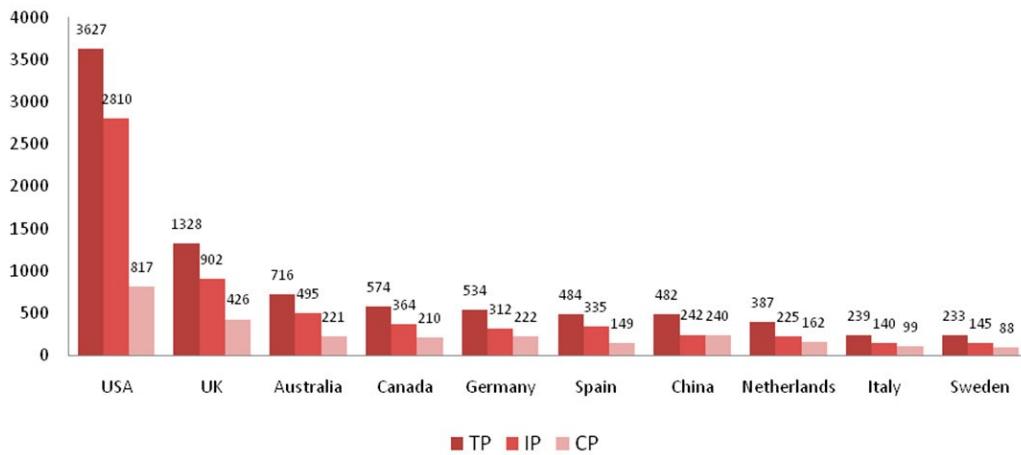


Figure 2. Most productive countries of social media papers during 2008–2014 (TP, total publications; IP, the number of independent publications by single-country; CP, the number of internationally collaborative publications).

3.4. Institution Collaboration Network

The Ucinet software calculates the eigenvalue centrality based on the algorithm described as the following [48]: given an adjacency matrix A , the centrality of vertex i (denoted c_i), is given by $c_i = a \sum A_{ij} c_j$, where a is a parameter. The centrality of each vertex is therefore determined by the centrality of the vertices it is connected to. The parameter a is required to give the equations a non-trivial solution and is therefore the reciprocal of an eigenvalue. It follows that the centralities will be the elements of the corresponding eigenvector. The normalized eigenvector centrality is the scaled eigenvector centrality divided by the maximum difference possible expressed as a percentage.

The collaboration network of the 69 most productive institutes was visualized using the Ucinet software (Figure 3). The node indicates an institute, while the nodal size relates to network eigenvalue centrality in the collaboration network and a nodal color means a specific cluster. As shown in Figure 3, the University Washington and the University Michigan had the highest network eigenvalue centrality. The most productive institution was the University of Wisconsin with 86 papers, followed by the University of Michigan with 82, and Harvard University with 75. The University of Michigan published the most inter-institutional collaborative publications, followed by Harvard University and the University of Wisconsin.

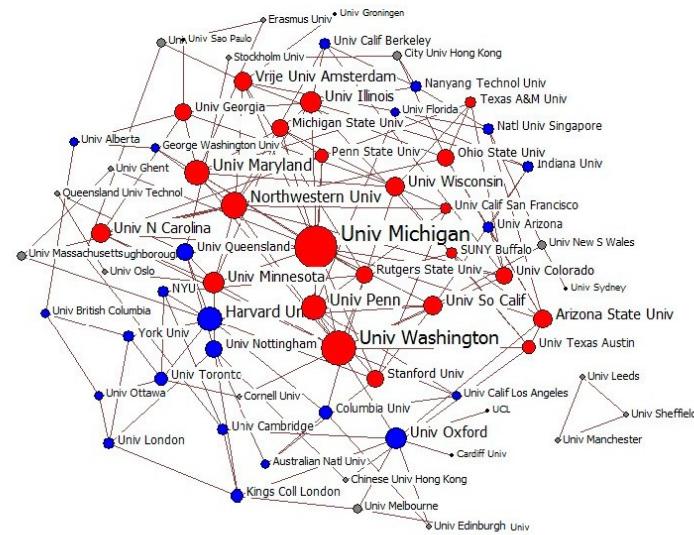


Figure 3. Institution collaboration network of most 69 central institution in social media research (red nodes, $k = 4$; blue nodes, $k = 3$; grey nodes, $k = 2$; black nodes, $k = 1$).

3.5. Author Keywords Analysis

3.5.1. Temporal Evolution of Author Keywords

Keywords supplied by the authors offered a profile of article contents. Temporal evolution to these keywords can be used to offer alternative perspective of research hotspots and trends. The 30 most frequently used keywords in the study period were calculated and ranked per year in Table 4.

It is obvious that six keywords ("Facebook", "Twitter", "communication", "Social Networking Sites", "China", and "climate change") received increasing popularity during the study period, likely indicating the hotspots and future research in social media area. The number of papers including author keywords "Facebook" and "Twitter" changed drastically from 0 to 123 and 129 respectively from 2008 to 2014, and these two author keywords ranked 3rd and 2nd respectively in 2014. Moreover, "social networking sites" relating to "Facebook" and "Twitter" also had an obvious upward trajectory in its rank from 179th in 2009 to 8th in 2014. This indicates that the subject of social networking websites itself and special sites such as "Facebook" and "Twitter" received more and more attention during the past five years. Social networking sites, defined by their unique focus on allowing people to "friend" others and share content with other users, are some of the most important kinds of social media. It is estimated that Facebook has 900 million visitors per month, while Twitter has 310 million visitors per month. In addition, "communication" underwent the rank growth from 51st in 2008 to 9th in 2014. This is consistent with the fact that communication with friends and family members is the most common function used on social networking sites, and social media has dramatically changed how we communicate. The analysis above concluded that Communication was the most common subject category for social media. As we expected, "China" increased continuously from 353rd in 2008 to 13th in 2014, suggesting that China remained a hot research topic during the past seven years. This increase concurred with the sharp growth of social media platforms in China, with more than 400-million social media users in 2015. Furthermore, "climate change" has grown from 53rd in 2008 to 24th in 2014, indicating this area has become a new hot spot in social media research. Some keyword such as "big data" and "social support" entered the top 30 keyword list in recent years, to some extent indicating a future research trend in social media area.

Table 4. Temporal evolution of the 30 most frequently used keywords.

DE	GROSS			2008			2009			2010			2011			2012			2013			2014		
	N	R	P (%)	N	R	P (%)	N	R	P (%)	N	R	P (%)	N	R	P (%)	N	R	P (%)	N	R	P (%)	N	R	P (%)
social networking	427	1	0.78	20	3	2 (0.54)	27	3	1 (0.63)	34	3	1 (0.63)	64	3	1 (0.93)	79	2	1 (0.88)	90	4	3 (0.79)	113	4	3 (0.81)
Internet	395	2	0.72	24	2	1 (0.65)	27	5	1 (0.63)	32	4	2 (0.60)	42	4	2 (0.61)	59	4	2 (0.65)	100	2	1 (0.88)	111	5	4 (0.80)
Facebook †	299	3	0.55	—	—	—	5	69	22 (0.12)	4	96	27 (0.07)	20	11	8 (0.29)	56	5	3 (0.62)	91	3	2 (0.80)	123	3	2 (0.88)
Twitter †	288	4	0.53	—	—	—	1	773	30 (0.02)	3	206	29 (0.06)	19	12	10 (0.28)	48	6	4 (0.53)	87	5	4 (0.76)	130	2	1 (0.93)
Adolescents	228	5	0.42	20	4	2 (0.54)	21	5	3 (0.49)	26	6	4 (0.49)	31	6	4 (0.45)	33	8	6 (0.37)	38	9	7 (0.33)	59	7	5 (0.42)
Youth	193	6	0.35	8	17	13 (0.22)	12	15	11 (0.28)	28	5	3 (0.52)	29	8	6 (0.42)	28	10	8 (0.31)	45	7	5 (0.40)	43	10	8 (0.31)
Web 2.0	183	7	0.34	6	28	20 (0.16)	7	30	18 (0.16)	15	11	9 (0.28)	52	5	3 (0.47)	47	7	5 (0.52)	35	12	10 (0.31)	41	11	9 (0.29)
gender	164	8	0.30	12	6	5 (0.33)	16	7	5 (0.37)	20	8	6 (0.37)	30	7	5 (0.44)	21	14	12 (0.23)	36	10	8 (0.32)	29	18	16 (0.21)
mass media	161	9	0.30	17	5	4 (0.46)	21	6	3 (0.49)	22	7	5 (0.41)	23	9	7 (0.34)	28	11	8 (0.31)	28	13	11 (0.25)	22	25	20 (0.16)
communication †	137	10	0.25	4	51	23 (0.11)	12	16	11 (0.28)	9	22	17 (0.17)	15	17	14 (0.22)	16	21	17 (0.18)	36	11	8 (0.32)	45	9	7 (0.32)
new media	132	11	0.24	5	34	22 (0.14)	14	11	7 (0.32)	8	29	22 (0.15)	15	19	14 (0.22)	31	9	7 (0.34)	20	22	18 (0.18)	39	12	10 (0.28)
social networking sites †	131	12	0.24	—	—	—	3	179	29 (0.07)	5	79	26 (0.09)	12	28	22 (0.17)	21	15	12 (0.23)	39	8	6 (0.34)	51	8	6 (0.37)
social capital	122	13	0.22	12	7	5 (0.33)	12	13	11 (0.28)	17	9	7 (0.32)	12	27	22 (0.17)	15	28	20 (0.17)	26	15	13 (0.23)	28	20	17 (0.20)
social movements	118	14	0.22	6	29	20 (0.16)	6	37	19 (0.14)	9	24	17 (0.17)	18	14	11 (0.26)	22	13	11 (0.24)	24	18	16 (0.21)	33	15	13 (0.24)
Identity	117	15	0.21	11	9	8 (0.30)	14	9	7 (0.32)	6	51	25 (0.11)	20	10	8 (0.29)	25	12	10 (0.28)	22	19	17 (0.19)	19	30	22 (0.14)
China †	112	16	0.21	1	353	26 (0.03)	9	24	16 (0.21)	12	17	12 (0.22)	13	25	20 (0.19)	18	16	14 (0.20)	21	21	18 (0.18)	38	13	11 (0.27)
Content analysis	112	17	0.21	12	8	5 (0.33)	6	34	19 (0.14)	12	18	12 (0.22)	7	58	30 (0.10)	18	17	14 (0.20)	27	14	12 (0.24)	30	17	15 (0.22)
technology	110	18	0.20	7	10	15 (0.19)	4	8	27 (0.09)	7	19	23 (0.13)	16	13	13 (0.23)	16	25	17 (0.18)	25	31	14 (0.22)	35	22	12 (0.25)
television	110	19	0.20	11	21	8 (0.30)	15	73	6 (0.35)	11	42	15 (0.21)	18	15	11 (0.26)	15	20	20 (0.17)	16	16	15 (0.14)	24	14	19 (0.17)
Corporate social responsibility	97	21	0.18	7	22	15 (0.19)	14	10	7 (0.32)	12	15	12 (0.22)	14	22	18 (0.20)	15	26	20 (0.17)	19	23	20 (0.17)	16	44	28 (0.11)
children	99	20	0.18	10	12	10 (0.27)	12	14	11 (0.28)	14	12	10 (0.26)	14	21	18 (0.20)	16	22	17 (0.18)	16	30	25 (0.14)	17	37	26 (0.12)
Education	96	22	0.18	7	23	15 (0.19)	5	49	22 (0.12)	9	26	17 (0.17)	9	41	28 (0.13)	17	18	16 (0.19)	17	28	24 (0.15)	32	16	14 (0.23)
discourse †	84	23	0.15	9	15	12 (0.25)	13	12	10 (0.30)	16	10	8 (0.30)	11	29	24 (0.16)	10	53	25 (0.11)	13	42	28 (0.11)	12	64	29 (0.09)
Ethics	82	24	0.15	8	18	13 (0.22)	6	35	19 (0.14)	9	23	17 (0.17)	13	26	20 (0.19)	15	27	20 (0.17)	14	36	27 (0.12)	17	38	26 (0.12)
Public health	81	25	0.15	4	52	23 (0.11)	9	21	16 (0.21)	4	92	27 (0.07)	10	36	25 (0.15)	9	67	28 (0.10)	25	17	14 (0.22)	20	28	22 (0.14)
risk	80	26	0.15	10	13	10 (0.27)	5	48	22 (0.12)	9	25	17 (0.17)	15	18	14 (0.22)	10	51	25 (0.11)	18	26	22 (0.16)	13	53	29 (0.09)
culture	80	27	0.15	1	354	26 (0.03)	10	19	15 (0.23)	14	13	10 (0.26)	15	16	14 (0.22)	9	65	28 (0.10)	13	43	28 (0.11)	18	34	25 (0.13)
Climate change †	79	28	0.14	4	53	23 (0.11)	5	55	22 (0.12)	3	148	29 (0.06)	10	37	25 (0.15)	15	29	20 (0.17)	19	24	20 (0.17)	23	24	20 (0.16)
journalism	78	29	0.14	7	24	15 (0.19)	5	61	22 (0.12)	11	20	15 (0.21)	9	44	28 (0.13)	9	75	28 (0.10)	18	27	22 (0.16)	19	32	22 (0.14)
Trust	75	30	0.14	7	22	15 (0.19)	4	75	27 (0.09)	7	45	23 (0.13)	10	35	25 (0.15)	10	51	25 (0.11)	11	62	30 (0.10)	26	21	18 (0.19)

DE, author keywords; N, articles in the study period; R, the absolute rank of author keywords; P, the relative rank of author keywords; %, the percentage of author keywords; -, no such author keyword in specific time period; †, rising trend; ‡, declining trend.

The ranks of some of the most frequently used keywords during 2008–2014 retained relative stabilization. This indicates that these keywords are hot issues in social media study. “Adolescents”, “youth” and “children” means young people is hot issue in social media research during past 7 years. “Web 2.0”, the technology base of social media, is always an important subject during 2008–2014. “social capital”, “social movement”, “education”, “ethics”, “public health”, “culture”, and “journalism”, which concerned sociology, education, health, and culture and media fields, suggested that social media research connected tightly with the application fields and had the characteristics of interdisciplinary and multi perspective.

On the contrary, the rank of “discourse” experienced an apparent decline during the study period, and the ranks of “mass media”, “gender”, and “risk” have also dropped in recent years. In addition, “obesity”, “HIV/AIDS”, “body image”, “violence”, and “qualitative research” that used to be 30 most frequently adopted keywords have faded away in most recent years.

3.5.2. Author Keywords Co-Work Network Analysis

Co-occurrence relationships among top 90 high-frequency keywords were examined, and the co-word networks were visualized (Figure 4). The nodes are high-frequency author keywords, the size of which represents the value of network eigenvalue centrality. The higher value means the stronger the connectivity and control. The segment indicates the connection relationship between two words. Moreover, the different colors indicate degree of core or edge, and the red nodes stand for the core themes.

As shown in Figure 4, the author keywords with the highest network eigenvalue centrality were “social networking” and “Internet”, and the other core themes including social networking sites correlative themes such as “Facebook”, “Twitter”, “YouTube”, and “social networking sites”; technology correlative themes such as “Web 2.0”, “technology”, and “content analysis”; concept concerned themes such as “new media”, “digital media”, and “mass media”; industry concerned themes such as “education” and “journalism”; and interested points concerned themes such as “climate change”, “globalization”, “politics”, “community”, “culture”, “democracy”, “youth”, “adolescents”, “ethnography”, “race”, “gender”, “identity”, and “privacy”. This is all evidence for the research hotspots in social media field during the study period.

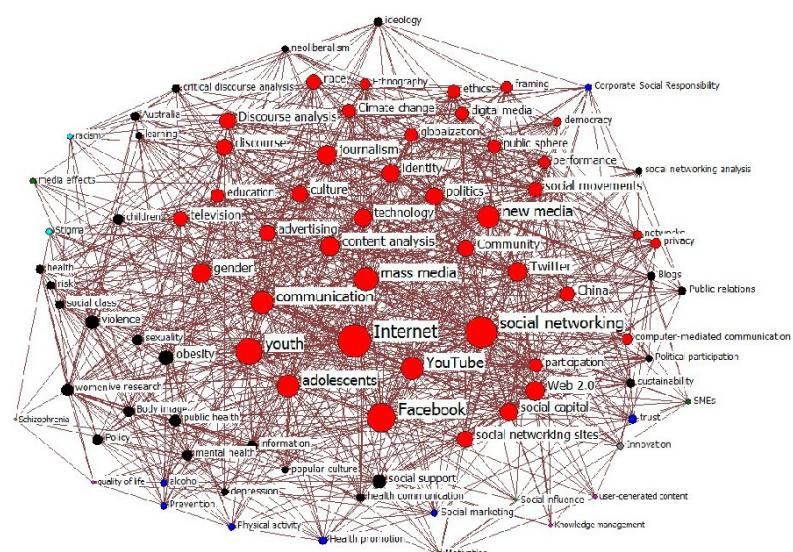


Figure 4. Co-work network of top 90 high-frequency author keywords (co-work network, **red** nodes, $k = 18$; **blue** nodes, $k = 16$; **black** nodes, $k = 15$; **grey** nodes, **cyan** nodes, $k = 13$; $k = 12$; **dark green** node, $k = 11$; **light green** node, $k = 10$; **pink** nodes, $k = 8$; **yellow** nodes, $k = 6$).

4. Conclusions

From 2008 to 2014, the annual publications of social media increased from 716 to 2509, with an average annual growth rate of more than 20%. A total of 10,042 articles were listed in 221 ISI-defined subject categories and appeared in 2360 ISI-indexed journals. The five most common categories in the publications were Communication, Sociology, Public, Environment & Occupational Health, Business and Multidisciplinary Psychology, accounting for 41.88% of all articles. In addition, the five most productive journals on social media were *Computers in Human Behavior*, *New Media & Society*, *Public Relations Review*, *Information Communication & Society*, and *The Journal of Medical Internet Research*. Among these journals, *Computers & Education* had the average citations of 13.44 and an IF of 2.63, ranked 1st and 2nd respectively.

The geographic and institutional distributions of publications suggested that the most productive country was the U.S., contributing the most single-country and international collaborative articles. UK published the second highest number of articles. These two countries published 4955 articles, 49.88% of the total articles. Out of these top 10 productive countries, 7 were from Europe, 1 was from North America, 1 was from Oceania, and 1 was from Asia.

A keywords analysis through temporal evaluation and co-work network analysis social networking sites demonstrated that technology, concept, industry, and interested points were consistent topics that grabbed the most attention during the study period. Several keywords, such as "Facebook", "Twitter", "communication", "Social Networking Sites", "China", "climate change", "big data", and "social support" attracted increasing attention, indicating future research trends.

The collaboration network of the top 69 most productive institutes suggested the University of Washington and the University of Michigan owned the highest network eigenvalue centrality. The most productive institution was the University of Wisconsin, followed by the University of Michigan and Harvard University. The University of Michigan published the most inter-institutional collaborative publications, followed by Harvard University and the University of Wisconsin. The analytical framework suggested in this paper can be expanded to databases other than SCI/SSCI and other time periods.

Acknowledgments: This material is partially based upon work supported by the National Science Foundation under Grant Nos. 1416509 and 1637242. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

Author Contributions: Quan Li, Wenbo Wei, and Xinyue Ye conceived and designed the study and outlined the methodology; Quan Li and Wenbo Wei analyzed the data; Nian Xiong and Daici Feng contributed materials; Yongsheng Jiang extensively updated the manuscript. All authors have read and approved the final manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

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