Tweeting about journal articles

Engagement, marketing or just gibberish?
Tweeting about journal articles: Engagement, marketing or just gibberish?

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What do we know about tweeting scientific literature?

• The (non-academic) social media platform mentioning the largest share of scientific papers – Costas, Zahedi & Wouters, 2015

• There is a low but positive correlation between citations and tweet mentions – Haustein et al., 2014

• Most tweets include the title of the paper or summary of contents – Thelwall et al., 2013
Intro What don’t we know about tweeting scientific literature?

• Lack of knowledge on ‘who’ is tweeting scientific literature – Ke et al., 2017

• Lack of explanatory theories on motivations for tweeting scientific literature – Vainio & Holmberg, 2017

• The effect of automated accounts on dissemination of scientific literature and on derived metrics – Haustein et al., 2016

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Context Dental Knowledge Networks project

• Understanding knowledge flows from scientific literature to professional practice in the field of Dentistry

• Diversity of potential audiences: scientists, practitioneers, students, patients…
Main goal: What role does Twitter play in scholarly communication?

Case study I

- Qualitative study
  1. Top 10 tweeted papers
  2. Analysis of Twitter accounts

Case study II

- Quantitative study (in progress)
  1. Analysis of tweets at the journal level
  2. Comparison between citation and tweet networks
  3. Analysis of Twitter activity of journals
Material & Methods

General dataset

- 124 dental journals from PubMed (84 from Web of Science)
- 196,812 research articles
- Journals assigned to specialties
- We use the PMID number to retrieve tweets linking to the paper from Almetric.com
- 15,894 articles were linked from tweets. 8.1% of the total dataset
- A total of 52,540 tweets were identified

# JOURNALS

- General
- Orthodontics
- O&M surgery
- Regional
- Implantology
- Misc
- Periodontics
- O&M pathology
- Prosthodontics
- Pediatric
- Public Health
- Endodontics
- Hygiene
- Magazine
- O&M radiology
Case I The dental conversation in the US
Case I Material and Methods

• We selected tweets originating from the United States
• A total of 8,206 tweets linking to 4,358 papers was identified
• These tweets were sent between June 2011 and June 2016
• They belonged to a total of 2,202 Twitter accounts
Top 10 most tweeted papers
1. Analyzed tweet contents and papers
2. Identified users
3. Characterized tweeting patterns
**Case I** Results – Top 10 most tweeted papers

SINGLE ISSUE CAMPAIGNERS


| 264 tweets | 73% tweets from @autismepi | Auto-retweets | Exc Top 2 accounts 15 tweets |

Paracetamol research: [URL]  

#Acetaminophen- ‘may not be considered a safe drug in pregnancy’-offspring behavioral disorders, hormone disruption [URL]
## Case 1 Results – Top 10 most tweeted papers

**SINGLE ISSUE CAMPAIGNERS**


<table>
<thead>
<tr>
<th>70 tweets</th>
<th>70% tweets from @AnnChildersMD</th>
<th>17 accounts</th>
<th>Top 2 accounts retweeting</th>
</tr>
</thead>
</table>

**Title + URL**

- Does it cause tooth decay or gum disease? Avoid [URL] #LCHF
- Is your diet good for your teeth and gums? [URL]

51 tweets

Identical and continuous tweeting

41 accounts

Does wax make a difference in the effectiveness of dental floss? Check it out: [URL]
Case I Results – Top 10 most tweeted papers


- 59 tweets
- Tweets refer to conclusions of paper
- 41 accounts

Researcher: Fluoridation is "the most effective and practical" way to reduce dental disparities [URL] #OralHealthEquity
## Case I Results – Top 10 most tweeted papers

<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
<th>Cites</th>
<th>Tweets</th>
<th>Variants</th>
<th>@</th>
<th>Accts</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Single-issue campaigner</td>
<td>2015</td>
<td>9</td>
<td>264</td>
<td>71</td>
<td>103</td>
<td>15</td>
</tr>
<tr>
<td>#2 Single-issue campaigner</td>
<td>2009</td>
<td>36</td>
<td>70</td>
<td>30</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>#3 Broader tweeting</td>
<td>2002</td>
<td>42</td>
<td>59</td>
<td>4</td>
<td>0</td>
<td>41</td>
</tr>
<tr>
<td>#4 Broader tweeting</td>
<td>2007</td>
<td>159</td>
<td>54</td>
<td>3</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>#5 Social media manager</td>
<td>1982</td>
<td>17</td>
<td>51</td>
<td>2</td>
<td>0</td>
<td>44</td>
</tr>
<tr>
<td>#6 Single-issue campaigner</td>
<td>2016</td>
<td>12</td>
<td>39</td>
<td>13</td>
<td>2</td>
<td>34</td>
</tr>
<tr>
<td>#7 Social media manager</td>
<td>1999</td>
<td>NA</td>
<td>39</td>
<td>3</td>
<td>0</td>
<td>39</td>
</tr>
<tr>
<td>#8 Dup. tweets</td>
<td>2010</td>
<td>47</td>
<td>35</td>
<td>7</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>#9 Retweets from BDJ</td>
<td>2013</td>
<td>6</td>
<td>29</td>
<td>13</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>#10 Dup. tweets</td>
<td>2009</td>
<td>103</td>
<td>28</td>
<td>2</td>
<td>0</td>
<td>25</td>
</tr>
</tbody>
</table>

https://doi.org/10.1371/journal.pone.0183551.t001
Case I Results – Twitter accounts

EXAMPLES OF BOTS

• Automatic text pattern:
  True or false? release(100 thick, buffer solution) [URL] #Collagen
  @semantic_bot

• Human-like text pattern:
  this is a mouth wash that CAN eliminate bad bacteria LIKE stop
cavity's type of good thing? Yes it has bin approve…
  @gary_gschafe
Case 1 Results – Twitter accounts

EXAMPLES OF HUMANS

• The engaged tweeter:

Endosurgery has better initial success, but ReTx offers a more favorable long-term outcome.

There is a dose-response relationship btw cigarette smoking the risk of R

@endofactologist
Case 1 Results – Twitter accounts

- Most tweets although from humans showed no engagement with the paper
- Only 2.5% tweets came from bots
- 74% of tweeting about dental papers was produced by people behaving like bots

https://doi.org/10.1371/journal.pone.0183551.g001
Case II The role of journals promoting their contents
Case II Material and Methods

- The complete dataset was used
- Out of a total of 11,026 accounts 21 were identified related to journals
- Tweet network was overlayed from citation network (Leydesdorff et al., 2017)
- Indicators used: tweets, self-tweets, retweets and impressions

<table>
<thead>
<tr>
<th>Journal</th>
<th>Publisher</th>
<th>Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>
## Case II Results – General overview

<table>
<thead>
<tr>
<th></th>
<th>Journal</th>
<th>Association</th>
<th>Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong># tweets</strong></td>
<td>11825</td>
<td>561</td>
<td>85</td>
</tr>
<tr>
<td><strong>% self-tweets</strong></td>
<td>98.0%</td>
<td>84.8%</td>
<td>98.8%</td>
</tr>
<tr>
<td><strong># retweets</strong></td>
<td>59</td>
<td>218</td>
<td>16</td>
</tr>
<tr>
<td><strong># impressions</strong></td>
<td>9230</td>
<td>695</td>
<td>60</td>
</tr>
<tr>
<td><strong>Attention rate</strong></td>
<td>0.78</td>
<td>1.24</td>
<td>0.71</td>
</tr>
</tbody>
</table>
Case II  Results - Networks

A) Co-citation network

B) Overlay tweet network

Leydesdorff et al., 2017
Case II Results – Uptake rate

J Clinical Periodontology
Evidence-Based Dentistry
J Dentistry
J Dental Research
J Dental Education
British Dental J
BMC Oral Health
Australian Dental J
Community Dentistry Oral Epidemiology
European J Oral Sciences
J Oral Rehabilitation
J Prosthodontics
Oral Oncology
J Public Health Dentistry
Cleft Palate - Craniofacial J
J Craniofacial Surgery
Head Face Medicine
Operative Dentistry
Implant Dentistry

0 0,5 1 1,5 2 2,5 3
So...

Engagement, marketing or just gibberish?
Discussion Towards a better understanding of Twitter use in scholarly communication

• Twitter activity represent rich and valuable data but we are not capable to identify it

• The citation model does not work and should not be encouraged in altmetric studies if the purpose is research evaluation

• Attention, marketing and engagement are not the same, although they are related
Discussion Further research

1. Does tweet engagement affects dissemination?
2. Do journals follow a selection strategy of what is tweeted?
3. Are these strategies successful? Do they affect readership?
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THANK YOU!

@nrobinsongarcia, @RodrigoCostas1, @vulnerablepops, J. Melkers and D. Hicks