Beyond Citation Counts
The Potential of Academic Social Network Sites for Scientific Impact Assessment

Christoph Lutz
ASNA Conference 2013
Zurich, August 27 2013
Executive Summary

• Relational aspects neglected in scientific impact assessment

⇒ Academic SNS as a new source for SNA in science

• Case study of ResearchGate: low activity and density, high homophily and interesting centrality effects

⇒ Network position partly explainable by other measures of influence

• Following structure overlaps significantly with co-authorship
1 Measuring Impact in Science
Academic Impact Is A Multi-Faceted Construct
Academic Impact: New vs. Old

Usage-based Metrics

Bibliometrics from Peer-reviewed Journals
Usage-based metrics

- Publication on the web enables new metrics:
  - Webometrics
  - Scientometrics 2.0/Altmetrics

- **Goal:** achieving a more current and differentiated picture of impact

- Using social media data for person-based and article-based metrics
  (Priem & Hemminger, 2010; Shema, Bar-Ilan & Thelwall, 2013; Thelwall et al., 2013)
Example: ImpactStory

Tell the full story of your research impact.

ImpactStory aggregates altmetrics: diverse impacts from your articles, datasets, blog posts, and more.

Make my impact report or, show me a sample report

New!
Have you registered for an ORCID ID yet?
Create an ImpactStory report using ORCID

We track impact across the Web:
What about Social Capital and Relations?

- Relations with other researchers are important resources
  - *Promotion*
  - *Publication*
  - *Invitation*
  - *Collaboration*...

- Social capital matters

⇒ *Bringing in the relational aspect in impact measurement... beyond citations*
The ResearchGate Project
What is ResearchGate?

• Biggest SNS for scientists with 3 million users

• Based in Berlin and founded in 2008

• More than 30 million publication entries

• Vivid community, especially popular with young researchers in emerging countries
Christoph Lutz
lic. phil. / M. A.
University of St. Gallen - Institute for Media and Communication Management

7.41
RG Score

Profile completion 90%

TOPICS (24)
- Academic Writing
- Cultural Sociology
- Cultural Studies
- Online Social Networks
- Statistical Software
- Science Communication
- Social Capital
- Statistical Analysis

RESEARCH SKILLS

Technical
Add Technical skills

IT
Add IT skills

Statistical
- Descriptive Analysis
- Linear Regression
- Logit
- Multilevel Analysis
- Exploratory Factor Analysis
- Confirmatory Factor Analysis
- Structural Equation Modeling

Other
english, French, Spanish, German

ABOUT

I am pursuing a Ph.D. at the Institute for Media and Communication Management, University of St. Gallen (Switzerland). There, I am working in the field of new communication technologies and social media, especially in science and public administration settings. My background is in sociology, economics and media science, but I like interdisciplinarity and am open to different and challenging perspectives and ideas.... That’s what makes great research in my opinion!

FOLLOWERS (15)

FOLLOWING (48)

ADVISORS
The Project

• Evaluating new forms of impact in management research

• Intensity of interaction, followers, followees, activity, publication resonance, RG score etc.

• 55 participants from 11 institutes: 80 percent male

• 50 percent PhD, 30 post-doc/assistant profs and 20 percent full profs
The Network

- 55 nodes, 10 isolates
- Average Degree = 3
- Density = 0.06
- Diameter = 6
- Average Path Length = 2.43
- E-I Index = -0.08 (expected: 0.69)
- Clustering = 0.48
Network and Institute Membership

E-I Index: -0.08
(expected: 0.69)

Clustering: 0.48 (0.27)
# Predicting Network Centrality

<table>
<thead>
<tr>
<th></th>
<th>Indegree</th>
<th>Closeness</th>
<th>Betweenness</th>
<th>Eigenvector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seniority</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Reference: Master student=0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PhD Student (1)</td>
<td>.11**</td>
<td>.66***</td>
<td>n. s.</td>
<td>.22**</td>
</tr>
<tr>
<td></td>
<td>.28***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Doc without Professorship (2)</td>
<td>n. s.</td>
<td>.39**</td>
<td>n. s.</td>
<td>n. s.</td>
</tr>
<tr>
<td></td>
<td>n. s.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior/Assistant Professor (3)</td>
<td>.46**</td>
<td>.89***</td>
<td>n. s.</td>
<td>.70***</td>
</tr>
<tr>
<td></td>
<td>.71***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Professor (4)</td>
<td>n. s.</td>
<td>.83***</td>
<td>n. s.</td>
<td>n. s.</td>
</tr>
<tr>
<td></td>
<td>n. s.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publication Success</td>
<td>.37*</td>
<td>n. s.</td>
<td>n. s.</td>
<td>n. s.</td>
</tr>
<tr>
<td>(WOS h-Index; off platform)</td>
<td>n. s.</td>
<td>n. s.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publication Resonance</td>
<td>n. s.</td>
<td>n. s.</td>
<td>n. s.</td>
<td>.36*</td>
</tr>
<tr>
<td>(on platform)</td>
<td>.43*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online Activity</td>
<td>.50***</td>
<td>.21**</td>
<td>n. s.</td>
<td>.41***</td>
</tr>
<tr>
<td></td>
<td>.40**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ResearchGate Score</td>
<td>n. s.</td>
<td>n. s.</td>
<td>n. s.</td>
<td>n. s.</td>
</tr>
<tr>
<td>R²</td>
<td>70%</td>
<td>37%</td>
<td>41%</td>
<td>54%</td>
</tr>
</tbody>
</table>
Network and Academic Position

Blue=PhD
Black=Postdoc/Project Leader
White=Assistant Professor
Red=Full Professor
The Co-Authorship Network
Do the networks overlap?

Do researchers who write articles together also follow each other?

Yes... but the correlation is not very strong: 0.09 (p-value: 0.025)
Summary

- Indegree and closeness allrounders, betweenness most distinct
- Activity most important predictor of centrality (reciprocity)
- Academic position important but differentiated picture (inverted u-shape?)
- Publication success (h-index) important for overall indegree but not for faculty-specific indegree
- High homophily and clustering and low activity
The Road Ahead

• Sample extension to other research areas and universities

• More sophisticated data by including different social media

• Combining centrality with other criteria

• Looking at other publications (proceedings, book chapters...)

• ERGMing the s*** out of the data
Thank You For Your Attention
Interested in the Project and Collaboration?

Mail: christoph.lutz@unisg.ch

ResearchGate: http://www.researchgate.net/profile/Christoph_Lutz/
Academia.edu: http://independent.academia.edu/ChristophLutz
Mendeley: http://www.mendeley.com/profiles/christoph-lutz1/

@lutzid