

# Public engagement of scientists (Science Communication)

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**AUTHOR**

Nina Wicke

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**KEYWORDS**

*science communication, science communicators, scientists, social media*

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**BRIEF DESCRIPTION**

Public engagement of scientists is defined as “all kinds of publicly accessible communication carried out by people presenting themselves as scientists. This includes scholarly communication directed at peers as well as science communication directed at lay publics” (Jünger & Fähnrich, 2019, p. 7).

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**THEORETICAL FOUNDATION**

The variable “public engagement of scientists” can be differentiated according to the following three main dimensions (Jünger & Fähnrich, 2019):

1. Directions of engagement: Describes the extent to which communication scientists on Twitter connect with people from different sectors of society (e.g. science, politics, media, economy). This allows conclusions to the potential influence of scientists reaching specific audiences beyond the scientific community (Jünger & Fähnrich, 2019).
2. Topics of engagement: Previous research reveals that social scientists not only act as experts in their research field, but often present themselves as public intellectuals by also referring to political and social issues (Albæk, Christiansen, & Togeby, 2003; Fähnrich & Lüthje, 2017). For this reason, communication scientists are expected to communicate not only on scientific but also on political or economic issues.

Modes of engagement: In addition to disseminating information, social networking sites also allow for more interactive ways of maintaining relationships. Thus, following Ellison and Boyd (2013), it can be assumed that communication on social networking sites can be both content-centered and user-centered. This dimension can be linked to the speech act theory (Klemm, 2000; Searle, 1990), according to which every use of language has a performative function.

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**REFERENCES/COMBINATION WITH OTHER METHODS OF DATA COLLECTION**

In some cases, a mixed method approach, employing two data collection methods, is applied: a content analysis is complemented by a survey to gain information about the science communicators such as demographic information (Hara, Abbazio, & Perkins, 2019). Furthermore, their social networks are investigated by means of network analysis (Walter, Lörcher, & Brüggemann, 2019).

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**EXAMPLE STUDIES**

Hara et al. (2019); Jahng & Lee (2018); Kouper (2010); Mahrt & Puschmann (2014); Walter et al. (2019)

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**INFORMATION ON JÜNGER & FÄHNRIK, 2019**

**Authors:** Jakob Jünger & Birte Fähnrich

**Research questions:** RQ1: How can the public engagement of scientists in the context of online communication be conceptualized? RQ2: Which types of engagement occur in the Twitter activity of communication scholars?

**Object of analysis:** Tweets and followers belonging to the Twitter profiles of communication scientists who are following the International Communication Association (ICA) on Twitter



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(only German- and English-speaking users)

**Timeframe of analysis:** Data collection in September 2017

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#### INFORMATION ABOUT VARIABLES

**Variable name/definition:** Subject area of the content of the tweets

**Level of analysis:** Tweet

**Values:**

- Science-related topics (research, teaching)
- Non-scientific topics (politics, economy, media, sports, environment, society, leisure time, and others)

**Scale of measurement:** Nominal

**Reliability:** Gwet's AC1: 0,71 – 1,00

Holsti: 0,82 – 1,00

**Variable name/definition:** Language patterns of communication scientists (Speech acts)

**Level of analysis:** Tweet

**Values:**

- Actor-centered patterns (discussing, activating, socializing),
- Content-centered patterns (reporting, commenting),
- Other language patterns

**Scale of measurement:** Nominal

**Reliability:** Gwet's AC1: 0,54 – 0,95

Holsti: 0,75 – 1,00

**Variable name/definition:** References of the communication scientists on Twitter

**Level of analysis:** Tweet

**Values:**

- Self-reference,
- Reference to specific actor,
- Reference to other unspecific actor,
- No reference to actors

**Scale of measurement:** Nominal

**Reliability:** Gwet's AC1: 0,83 – 0,87

Holsti: 0,88 – 0,93

Kappa: 0,58 – 0,85

Krippendorffs' Alpha: 0,51 – 0,83

**Variable name/definition:** Type of actor (followers of the investigated scientists)

**Level of analysis:** Self description in profile

**Values:**

- Person,
- Organization

**Scale of measurement:** Nominal

**Reliability:** Gwet's AC1: 0,89

Holsti: 0,91

Kappa: 0,84

Krippendorffs' Alpha: 0,84

**Variable name/definition:** Social sphere of action of the followers

**Level of analysis:** Self description in profile

**Values:**

- Science (communication science, other sciences, science in general)
- Politics (party, state/administration, activists & lobbyists)
- Media (media & journalism, news & comments)
- Economy (communication industry, other economic sectors)
- Arts & Entertainment
- Health
- Other (Other areas of activity, personal interests)

**Scale of measurement:** Nominal

**Reliability:** Gwet's AC1: 0,81 – 0,87

Holsti: 0,82 – 0,88

Kappa: 0,83 – 0,85

Krippendorffs' Alpha: 0,83 – 0,85

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#### INFORMATION ON WALTER, LÖRCHER & BRÜGGEMANN, 2019

**Authors:** Stefanie Walter, Ines Lörcher & Michael Brüggemann

**Research question:** How do scientists interact with politicians and civil society on Twitter?

**Object of analysis:** Climate-related English-language Tweets posted by scientists from the United States (to classify the Twitter users, an automated content analysis, a dictionary approach, was applied; Krippendorffs' Alpha: 0,74)

**Timeframe of analysis:** Data collection took place from October 1, 2017 to March 31, 2018.

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#### INFORMATION ABOUT VARIABLES

**Variable name/definition:** Mode and content of communication

**Level of analysis:** Tweet

**Values:**

- Negative emotion,
- Certainty

**Scale of measurement:** Linguistic Inquiry and Word Count (LIWC) program for computerized text analysis

**Reliability:** –

**Codebook:** in the appendix (R-Script)

**INFORMATION ON HARA ET AL., 2019**

**Authors:** Noriko Hara, Jessica Abbazio & Kathryn Perkins

**Research questions/research interest:** RQ1: What kind of demographic characteristics do the scientists participating in “Science” subreddit AMAs have? [survey]

RQ2: What was the experience like to host an AMA in the “Science” subreddit? [survey]

RQ3: What type of discussions did “Science” subreddit AMA participants engage in?

RQ3a: Do questions receive answers?

RQ3b: What are posters’ intentions?

RQ3c: What kind of content features appear?

RQ3d: Who is posting comments?

RQ3e: What kind of responses do posts receive?

**Object of analysis:** Six Ask Me Anything (AMA) sessions on Reddit’s “Science” subreddit (r/science)

**Timeframe of analysis:** –

**INFORMATION ABOUT VARIABLES**

**Variable name/definition:** Poster’s intentions (PI); Answer status (AS); Comment status (CS); Poster’s identity (PID); Content features (CF)

**Level of analysis:** Post

**Values:**

PI:

- Seeking information,
- Seeking discussion,
- Non-questions/comments,
- Further discussion/interaction among users,
- Answering a question

AS:

- Answered,
- Not answered

CS:

- Commented on,
- Not commented on

PID:

- Host,
- Participant – flair,
- Participant – no flair

CF:

- Providing factual information,
- Providing opinions,
- Providing resources,
- Providing personal experience,
- Providing guidance on forum governance,
- Making an inquiry – initial question,
- Making an inquiry – embedded question,
- Requesting resources,

- Off-topic comment

**Scale of measurement:** Nominal

**Reliability:** Intercoder reliability ranged between 0.66 and 1.0 calculated by Cohen’s Kappa

**Codebook:** in the appendix (in English)

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