

# A Scheme for the Study of Discussions in the Social Media

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**Abstract:** In case one wants to study discussions in the social media one needs a template for doing this. The discussions can range from comments on some event to developing a deliberative democracy. This template, or scoring system, should give insight in developments in the substance of the discussion, but it should also allow considering the development of the structure of the discussion. In this text a template is proposed that covers both questions. The information that is collected by using the template might be useful in the context of (new) policy making; it can also be used to study opinions.

**Keywords:** discussion, deliberation, discourse, measurement, social media.

## 1. INTRODUCTION

Many types of media exist. Some contain one-way information, for example newspapers. The newspaper informs the reader. For other media, the communication between readers is more central, this species is known as social media. Social media is an umbrella name for applications that use the Internet and that are meant for individual users through a mix of different sources of information (like text, images and video) to interact intentionally and / or unintentionally in public or privately with other users of those applications. Social media are characterized by their open and social character. Each user has access to the media and, through interaction and sharing of knowledge, opinions and images, is able to shape the contents of the media. In this text the focus is on newspapers, although what is written can be applied to most social media. Newspapers offer in their online version often the opportunity to respond to an article. The responses can develop into full discussions. These discussions can be placed on a sliding scale.

On the one hand, there is the possibility to judge something. This is a one-time thing and then it is over. An example is that something has taken place and the judgement is: this is good or this is bad. Sometimes this judgement contains more detailed information: this is as good as or as bad as that other event. A motivation for the judgement is in general not given.

On the other hand, the article and the comments can be the beginning of a discussion. In the article something is stated. In the comment this is supported, refuted or extended. The same occurs in answers to the comment. In this way the participants in the

discussion contribute to knowledge regarding for example a certain event, a possible policy, a view on society. Potential contours of that what is under discussion become visible. An example of such is the (start of the) realization of deliberative democracy. How should such a democracy look like, or at least what is the effect of a number of bricks of this type of democracy? Most of all the first reactions often yield very valuable information; they can uncover (new) attitudes or opinions that are found in society. Questions on how to organize such discussions or how to keep them going are not addressed here. The goal in this text only is to provide a tool that allows following any discussion.

Social media are increasingly used in political context [1]. Microblogging serves as an ideal platform for users to spread not only information in general but also political opinions publicly through their networks. Political institutions (e.g., politicians, political parties, political foundations, etc.) have also begun to use pages or groups on social network sites for the purpose of entering into direct dialogs with citizens and encouraging more political discussions. Therefore a methodological framework is proposed for social media analytics in political context. More specifically, this framework summarizes most important politically relevant issues from the perspective of political institutions and corresponding methodologies from different scientific disciplines. A question that arises however is how to measure the progress of such discussions. With respect to the tool to be developed it must be considered what should be asked to understand the developments in these discussions?

Data are needed concerning the content of the discussion and the main participants, but also a method to score the development of the discussions in the social media. Such a scoring system does not inform about advances with regard to the topic the

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discussion is about, but on how the discussion progresses. Having such data one can investigate how these discussions develop in general. Differences between discussions can also be investigated, the differences might concern the fact that another topic is involved; the knowledge level that is required or the relevance is different, and so on.

One coding scheme is available to evaluate Internet forums in the light of the ideal public sphere [2]. This scheme assumes that messages are factual and that real arguments are exchanged. Practice is however that people often only exchange opinions, i.e., judgments, viewpoints, or statements about matters commonly considered to be subjective. Therefore the method is not sufficient, an extension is necessary. A scheme is needed that also includes opinions. This should enable a picture of how the discussions usually develop or develop in typical situations. As soon as these pictures are available one can look for a broader type of development in society.

A comparison to the evaluation of discourse as used in debate can be made. Here basically a similar structure is found. A scheme is already available for this evaluation [3]. The situation of the debate however is different from the situation where messages are interchanged via the media. One argument for this is that the one who is addressed to in the debate really is visible.

In order to make the whole project manageable one can look only at a specific kind of news that is discussed in the forums: general politics, home politics, foreign politics, economic politics, and so on. Another restriction has to do with the territory that is covered.

First it is explained how data that will be used look like. Next the focus is on how to get the data to be used and on how to analyze them. In the discussion it is questioned whether such research is realistic.

## **2. HOW DATA THAT WILL BE USED LOOK LIKE**

In broad lines two types of discussion are distinguished in the media. The first one is characterized by many messages based on one article dealing with some topic; the other consists of many messages based on one topic. The first type is found when an article appears in an electronic version of a newspaper (a special type of forum) or in a blog, which is a discussion or informational site published on the Internet and consisting of discrete entries ("posts"). Examples are: LiveJournal, Huffington Post, Business

Insider, Russia Today and Kyiv Post. An article or blog of this type can contain a lot of text and can at least consist of several points of view. The second type of message is found when tweets are analyzed. These messages are short ones. Therefore they usually contain only one view. The messages are not that detailed, reasoning or justification is often lacking.

An article of the first type usually contains factual information or an opinion with regard to policies, a specific (policy) person, or a specific group of people. People send messages to comment on what is discussed in the article and sometimes they also comment on the response presented by a participant in the discussion. Basically the article at the start can contain several opinions or views. In these examples single events are used, but also ongoing events are possible.

In broad lines two types of articles in newspapers are distinguished. In one type the author informs what is going on with respect to some issue(s). This might be a report of facts or an overview of opinions or decisions expressed by relevant people in the field. The second type is the editorial. Here someone clearly expresses an opinion, point of view, evaluation or personal position regarding a certain topic or event. Very often the content deals with a group that somehow has a role in the event. The author might explain how it has come this way, but also what is to happen. This is an opening to policy measures. In case an opinion is expressed people feel often challenged to comment on the editorial. Columns and commentaries are special types of editorials.

One of the interesting characteristics of Twitter is the possibility of retweets. It is possible to comment on a tweet. In the message both sender and receiver are mentioned. By examining the use of Twitter it is possible to assess the extent to which the new social media are used for political communication, the potential reach of that communication, and the interaction as users address each other and the communication emanating from broadcast media. There is a lot of attention for the interaction of individual users of Twitter. Attention is also needed for tracking the interaction of individual communication and broadcast communication.

In the situation where Twitter messages are analyzed it might be different. Even if an investigator has the permission of the sender of a message to use the information in it, this does not mean the investigator

also has the permission by the friends of the sender who received the message. This is an important aspect as here one often looks at communication networks: who communicates to whom, or better which group to which other group like communication between members of different political parties. For more details on this problem the reader is referred to [4].

The word *article* will be used to indicate the text a discussion started with. All comments on an article, but also all comments on a comment will be indicated as a *message*. With respect to the study to follow the messages are important, they contain the information that is to be analyzed. The article contains the background information and is the cause of the present discussion. It informs what the topic of the messages should be, but it also tells which position is taken at the very beginning with respect to this topic. Basically this position is positive (supporting), neutral or negative. Using the terminology of text analysis studies the message is the sampling unit. Depending on the type of analysis that is performed (see hereafter) the unit of analysis can be the complete message, or each separate paragraph in the message, or even each separate (nuclear) sentence.

### 3. TEXT MINING – GETTING THE DATA

The texts on which a study will be based are found on the internet, eventually as forum, blog or tweet. These texts should be downloaded and formatted in such a way that they can be entered into a computer program for text analysis. For this some preprocessing might be necessary. This all is a question of text mining [5, 6]. More specific is [7]. These authors present an approach to increase the probability of identifying all articles relevant to a topic, and provide an evaluation of its effectiveness in reducing bias while minimizing time expenditure.

Availability of data should not be a problem. A lot of media only use the internet. For newspapers however it might be different. They often appear both in a paper and an electronic version. Ridout, Fowler and Searles [8] investigated whether electronic newspaper databases contain all stories that appear in the print edition. The investigators compared the coverage of two topics in newspapers from cities across the USA and Canada with the coverage obtained from keyword searches in three electronic newspaper databases. It was found that stories obtained through electronic searches are consistent across databases but can vary from the print source. Importantly, national and

international coverage is more likely to be missing than local, provincial or statewide coverage.

Depending on the research question it is possible that only a specific type of articles is included. The investigator has to explain which articles are or can be included and which not. The investigator also can have reasons to include only a limited number of comments. If this happens most probable is that the first comments up to a certain number are used or the comments that appeared in a certain time interval after the publication of the article. The first method is used to limit the amount of comments; the second method will probably prevent the inclusion of a number of unjustified comments. The number however might also be read as an indication for the relevance of the topic.

### 4. DATA FOR ANALYSIS

The data analysis can go into two directions. The investigator might want to focus on the structure of the discussions, this is elaborated below. The investigator also might want to focus on aspects of the substance of the discussions: which issue gets most attention or which gets most attention at which moment in time. For this several tools as offered by text analysts are available. An overview of possibilities is presented in [9].

In this section the development of the discussion is examined. This progress is always analyzed in the same way. One point is to be taken into account however. The starting point for coding might be the substance of what is in the article or the position taken by the author. Assume a text informs that a person is performing very badly and this is in line with the feeling the author has about this person. If the person's performance is coded some aversion is to be expressed. If the position taken by the author is considered, a positive answer is needed because his thinking is supported. Hereafter this problem needs to be tackled.

The information that is needed for any of the analyses consists of two parts. On the one hand one needs some information to recognize the texts, article and messages, under study, on the other hand one needs information necessary to answer the research question concerning development. Especially the coding of the variables that concern the development usually demands an interpretation by the coder, for that reason it cannot (yet) be automated.

In order to recognize a text one needs at least the following information:

- the medium (name of the newspaper / website) (var01);
- title of the publication (var02);
- author of the publication (var03);
- date of publication (var04);
- time of the publication (var05);
- the topic of the article (var06);
- whether the article is an editorial or not (var07).

If wanted and if available one can also register the URL of the publication. With respect to messages that are collected commenting on an article or on an earlier message it is helpful when the sequence number within that series is also available (var08). If a message refers to an earlier message, this can be indicated by using the sequence number. The name of the author can be problematic, as it sometimes is a nickname. Someone can participate under different names in one thread, an investigator can only hope and assume that this does not happen. Nevertheless the name used by the author of the message must be noted (var09). The name might be needed to find the messages that comment on other messages. It might also be possible later on to distinguish between types of persons, for example persons whose message(s) only contain an attitude versus factual information. The time at which the comment appeared is also useful (var10). It might help determining the sequence of messages, but more important is that it can be used as an indication for the fact whether the author could have known some other comments or not.

In case a message refers to an earlier message it might be useful to know the sequence number of this earlier messages (var11), besides it might be useful to know the name of the author of this earlier message (var12), it will inform on the number of times specific persons are commenting on each other.

In general there is also a lot of information that seems relevant no matter which specific research question is at the start of the investigation. The main part of the coding scheme provided by Graham and Witschge [2] concerns the messages. The authors label these as responses. Two types of responses are

distinguished, and within each type some subtypes. The two types are non-reasoned and reasoned claims.

The scheme looks like a rather theoretical one. It does not clearly distinguish between facts and attitudes. Graham and Witschge present counts of the occurrence of the different types, however without giving examples of the types. They also show some patterns of who is responding to whom; just in order to show how the progress in the discussion might look like. We build on this method. The initial rational argument is the article at the start of the discussion. It is a missive, which provides a validity claim. An argument or justification is at present for this claim. The response category concerns the messages. The type *irrelevant* refers to messages in which remarks are made that are not useful in any way, regularly there is a message like: "Hey Johnny, are you back in the race?" So far Graham and Witschge are followed. But then it becomes different.

The measurement of a number of concrete characteristics for each message is proposed. Afterwards these measures can be combined into other, more theoretical, variables, even into the ones listed above.

In general there is always a lot of information that seems relevant no matter the concrete research question. The following information regarding a message is necessary in almost all studies. Any article or message can contain facts, opinions or arguments. Considering the goal of our classification system it does not seem relevant to distinguish between these types. A benefit of this position will be that one difficult coding task is not necessary. First it is to be decided on what the message is a comment (var13):

1. the topic of an article;
2. the content of an article;
3. the topic of a message;
4. the content of a message;
5. irrelevant.

It occurs very often that the message is about the topic of an article, but not about the content. The topic only was the motivation for writing a message. The same might hold for a specific message. As noted before some people even write responses that are not useful in any way, see the remark above about Johnny

being back in the race. Therefore one needs a category to capture this. This is done in the category labeled *irrelevant*.

Next more specific information regarding the message is needed. The investigator might want to know how the position expressed in the message corresponds to that what is stated in the article or an earlier message. Here is a list to start with (var14):

11. shows support / affirmation to policies as discussed in article;
12. shows support / affirmation to (policy) person as discussed in article;
13. shows support / affirmation to group as discussed in article;
16. shows support / affirmation to article;
17. shows support / affirmation to author article;
18. shows support / affirmation to message;
19. shows support / affirmation to discussion in general;
21. shows aversion / critics to policy as discussed in article;
22. shows aversion / critics to (policy) person as discussed in article;
23. shows aversion / critics to group as discussed in article;
25. shows aversion / critics to journalists;
26. shows aversion / critics to article;
27. shows aversion / critics to author article;
28. shows aversion / critics to message;
29. shows aversion / critics to discussion in general;
31. neutral to policy as discussed in article;
32. neutral to (policy) person as discussed in article;
33. neutral to group as discussed in article;
36. neutral to article;
37. neutral to author article;

38. neutral to message;
39. neutral to discussion in general;
41. explains own position;
51. adds information to article;
52. improves information in article;
53. builds on information in article;
54. refutes / rejects information in article;
55. asks for additional information in article;
61. adds information to message;
62. improves information in message;
63. builds on information in message;
64. refutes / rejects information in message;
65. asks for additional information in message;
75. asks for additional information from author;
81. straightens discussion – content;
82. straightens discussion – form;
83. pleas for respect;
98. questionable / ambivalent;
99. irrelevant.

The problem of coding in line with the article should be solved now (at least for the far greatest part) because we observed what received support or aversion when opinions are coded. The categories 11–39 mainly inform about the attitude with respect to what the discussion is about, it is expected these categories occur most. With respect to the deliberative democracy the categories of interest are the ones indicating that a message builds on an article or a message, or refutes it (51–75). Here the label *information* refers to information based on facts or on arguments. These categories are especially relevant if one wants to study for example deliberative democracy as proposed by Habermas [10]. There are also categories that code the quality of the discussion. Category 99 applies when category 5 under var11 pertains.

Variable 12 is the most important one for reconstructing how the discussion has developed. The

event structure analysis method [11, 12] can be used for this rebuilding. In doing so each message is considered as an event. The method allows a graphical representation and allows computing the probability of each connection. Besides it allows bringing labels of relations between events to a higher level of abstraction.

At this point a content related variable might also be entered (var15). In case one of the categories 11–13 or 21–23 applies one might want to know who deserves the support or the critics given in the messages, so this might be noted. It is impossible to suggest general categories here, as these are depending on the substance of the research project. In case the substance is a worldwide problem, the categories might refer to countries that play a relevant role and / or to institutions like UN, NATO, World Bank, and so on.

Next it should be asked whether an explanation given for the position taken in var14? (var16) This explanation can be an argument, but also a simple example:

1. no (no reasoning, no justification);
2. no, but gives additional information or seeks to affirm another position / statement without justification;
3. yes (reasoned / justified);
4. asks additional information;
5. uncertain.

Sometimes commenters propose an alternative or opposing claim. Different types of arguments might be considered now [2]: counter-argument (an argument or set of reasons which responds to an initial rational-affirmation or argument by proposing an alternative claim; different from contradiction in that it is backed up by supporting evidence and/or reasoning); rebuttal (the act of answering one's counter-argument, defending the initial rational-affirmation or argument in a reasoned/justified manner); refute (the reasoned/justified response to a rebuttal; finding a mistake in the other's comment and explaining why it's mistaken, often quoting the other person); rational-affirmation (the reasoned/justified affirmation brought in support of another user's/author's claim). These types of arguments as not included as they are already captured in the categories 62–65 in var14.

Investigators have proposed to enter levels of justification for the situation in which a justification applies (var16 category 3). Steenbergen *et al.* [3] mention: (0) no justification; (1) inferior justification; (2) qualified justification; (3) sophisticated justification.

Additional information that is asked for in a message is considered as a reasoned argument. In case above an answer is given one might look how the argumentation is formulated. Here Graham and Witschge is followed no matter whether the article or message is supported or opposed. The categories are formulated for the situation the answer is supported (var17):

1. supported by analogy / example (a message, which supports the answer by using analogies and / or analogical examples);
2. supported by assertion / assumption (a message, which supports the answer by asserting a conviction or by assuming certain things to be as such);
3. supported by experience (a message, where the author uses a personal or second hand experience to support an answer);
4. supported by factual information (a message, which supports the answer by providing factual evidence, which could include citations to outside sources or references to facts).

The next characteristic of the message that is relevant has to do with the use of language. When a message is about something or someone about which a negative or prejudiced feeling exists, the author of a message might feel challenged to start calling names. Now the language used contains sarcasm or insults or indignity (var18):

1. no, correct formulations;
2. expresses sarcasm / irony;
3. expresses fulmination;
4. expresses hate.

One has to be careful with this var18, it is possible that the newspaper's editorial office has already filtered on comments that are for some reason unacceptable.

Other variables that are not mentioned yet depend on the theory and on what the investigator specifically wants to know.

To learn why people participate in a discussion one has to ask them, based on their contribution one can already learn how participants contribute. This is done by looking at motivated reasoning. Such reasoning focuses on strategies that are used for accessing, constructing and evaluating beliefs. Here two goals are important. Reasoning might be driven by accuracy; the speaker wants to maintain a correct belief about a given issue. Reasoning might also be driven by a directional goal; the speaker wants to uphold and maintain a desirable conclusion and rejects disconfirming information. Accuracy refers to a need for cognition, directionality to a need of evaluation. Based on that each goal can be treated as an ideal type that is strongly or weakly at issue. Lodge and Taber [13] distinguish four styles which might be used (var19):

1. intuitive scientist (strong accuracy, strong directionality) - seeks an accurate conclusion within subjective limits; actively adjusts for bias;
2. partisan reasoner (weak accuracy, strong directionality) - seeks to justify preferred conclusion; confirmation or disconfirmation biased in information processing; disconfirming evidence may polarize attitudes;
3. classical rationalist (strong accuracy, weak directionality) - "enlightenment man"; reasoning as dispassionate calculation; normative ideal;
4. apathic (weak accuracy, weak directionality) - low motivation; heuristic processing; possibly no processing.

It is questionable whether all information can be coded automatically by machine, but one should give this possibility a try. Hand coding always is expensive, coders first need training and next have to do the coding. For machine coding a dictionary is needed.

Even when complete machine coding is not possible, it might be that some parts of the coding task can be automated. A learning system [14] might at least take away a lot of typing errors in the texts; it might also suggest specific coding at various places. The system might also assist in getting grip on all kinds of ambiguity that occur in texts [15, 16]. This might be done in the computer program that finally performs the text analysis, but it can also be in the program that looks for the texts or even in a program in between. If one of the latter two is used one can also guarantee that the program takes care of a specific format for the texts, so that they can be entered at once into a text

analysis program. When coding is performed by humans and actually also when a learning system is used it is necessary to perform some check coding. One should also find out whether the group of people participating in the discussion is different or not from the population and, if the article is taken from the electronic version of a newspaper, from the group of readers of that newspaper [17].

By combining answers to different variables as defined above it is possible to develop other classifications or to go back to for example the classification by Graham and Witschge.

## 5. CONCLUSION AND DISCUSSION

A scoring scheme for reconstructing discussions in the public sphere has been proposed. These are discussions in newspapers, on the internet, and to a lesser amount if one wants to follow discussions based on twitter or tweets. Other variables than the ones mentioned above might be added. These variables depend on the research question to be answered.

With regard to studies like these there are always some questions that cannot be solved beforehand. For these questions each time a solution must be provided by the investigator. One of such problems concerns the data. Should it be necessary to make generalizations based on the sample of texts that is investigated? If so, a random sample of some population is needed. The investigator has to realize that such a sample will be available. The sample will always be a sample of articles. Furthermore one has to be aware that as a set of messages refer to only one article one will have a nested research design.

Even if a kind of case study is performed it is necessary to indicate that the data are a good representation of what is taking place in the group or groups under study. If a comparison between groups is made, the investigator should be able to explain why this comparison is allowed.

In order to test whether the proposed system is realistic, it should now be tested which respect to a concrete research question.

## 6. COMPUTER PROGRAM

A first computer program for coding discussions following the scheme is available from the author. This computer program reads the text and the comments in a specified format. It allows all the coding mentioned in

the text. In the program var15 is optional. The user has to provide the categories for this variable in a separate text file. In case this file is not available the variable is skipped during coding. The program generates SPSS syntax. In the syntax file each article is indicated by a number and each person taking part in the discussion is labeled automatically. The program also generates a list of articles, including date of appearance, title and author.

The user has to take care of a program that transforms the format in which the article including comments appeared into the format required by the program. A text is available that gives suggestions for developing such a program, one can also do the changes by hand.

The required format implies that certain keywords are used. The keywords refer to the relevant attributes of the articles and the messages, like date and time of publication, author, title, and so on. The keyword is to be followed by the corresponding attribute.

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