

Appendix

Appendix A.

Codebook for determining Inclusion/Exclusion of Articles (Stage 1).

Description of Review

In recent years news sites (e.g., CNN.com, the New York Times, etc.) have provided readers the ability to not just read their news articles, but to actively engage through commenting under these articles (like a digital version of reader's letters in the newspaper). Since this trend began, researchers have started to study the impact of these comments on our perceptions. Questions include; What kinds of comments do people write? How do these comments impact how we view news articles? How do these comments impact the way we view the world around us (e.g., think about certain political topics, perceive public opinion, outgroups groups and political actors)?

We are interested in assessing what past research has to say about these comments under news articles. Therefore, we will be looking at collecting research papers that tell us the following 1) what is written in these comments (i.e., what is the content), 2) how do these comments impact our reception of news article (e.g., do these comments make us pay more or less attention to the article), and 3) how do these comments affect us (e.g., do such comments change our political attitudes? Do they change our views regarding the quality of the article? Do they affect how we respond when commenting on an issue?)?

As a first step we are looking to systematically search and find all research articles related to these topics. We have already developed a search query on Web of Science that collected all potentially relevant articles. Now we need your help systematically going through these articles and deciding which ones are relevant for our review.

Inclusion Criteria

- 1) Only include articles that are written in English
- 2) No conference papers (we are looking only for articles that have been peer-reviewed and published in journals, no pre-prints without peer review). This can be articles that appeared *OnlineFirst*, which means that an article is available online only, but has not been printed (formally published) in a journal issue. We look for both OnlineFirst (sometimes called EarlyView) articles or formally published articles.
- 3) Only include papers that present data in a quantitative way. Do they do statistical analyses? Run studies? *Note*: If a paper analyzes secondary data (i.e., previously collected data) that is fine too. Please include these papers. Theoretical papers, think pieces, reviews should not be included. Also, qualitative approaches like discourse analyses that do not use quantitative statistical methods (e.g., qualitatively assessing small amounts of individual reader comments, or interviews) should be excluded.
- 4) We only want to include papers that are really about what we want to review. For this criterion, focus on their analysis. Does at least part of the analysis focus on user-generated/reader comments? *Note*: Here we are only focused on comments under news articles.

*Sometimes, these news articles are posted on social media and then people comment under those news postings. We *are* interested in these kinds of papers.

*Sometimes, researchers focus on comments (not under news articles), for example comments under an influencer's post or comments under a photo on Facebook. We *are not* interested in these kinds of papers.

*What is considered news content? A news article from CNN, Breitbart, a video of an interview from a foreign news site, etc. What is not considered news content? A Tweet from Trump, an influencers post, etc.

IMPORTANT: If you are unsure whether an article fits all the above criteria, pull it out for the research team to analyze ourselves.

For Papers That DO NOT Fit Criteria:

Please put them in a separate folder and briefly say why a paper was excluded (1-4, e.g., 1 = Paper is in Spanish, 2 = Paper is a pre-print/not peer reviewed; 3 = Paper does not present data (or is qualitative), 4 = Paper deals with an Influencer/no news context)

For Papers That DO Fit Criteria:

Whenever you come across a paper that fits all the above criteria, we ask you to pull out a little information for us. We would like to know what method they used to analyze data.

- 1) Did the researchers complete a **content analysis**? A content analysis would analyze the content of comments. For example, they may test the number of negative words that were used in a set of comments under New York Times articles. Quantitative content analyses will test whether there are systematic patterns in words, themes, or concepts within a set of comments using some type of statistical approach.
- 2) Did the researchers conduct a **survey** (without an experiment)? In this case, the authors would have asked a series of questions to people. Quantitative surveys do not have any conditions and do not manipulate anything. For example, the researcher could ask participants how they feel after reading comments below news articles in their daily lives.
- 3) Did the researchers conduct an (quasi) **experiment**? In this case, the researcher would have manipulated something (meaning there would be at least two conditions), shown the manipulation to participants, and asked them what they thought about it. An example of this could be that people were exposed to a news article with no comments below or a news article with lots of comments below and tested whether this manipulation (i.e., no comment vs comment) changes participants' beliefs about the credibility of the news article.
- 4) Did the researchers conduct **observational research**? In this case, the researcher observes behavior rather than asking participants questions. For example, they may test how comments on news articles influence where our eyes look to while reading the article (eye-tracking).

Note: Sometimes one paper will have multiple methods (e.g., a survey and two experiments or 1 content analysis and 1 experiment). If this is the case please just note each type of method in the "Research Method" column. You should say the method for each study (e.g., "Study 1: content analysis, Study 2: experiment")

IMPORTANT: If you are unsure which research is being conducted, make a note of that in the "Research Method" column. Then the research team can check.

Appendix B.

Codebook for how to Code Included Articles (Stage 2).

Systematic Review Codebook

For this review each research assistant (RA) will code half of the corpus of selected papers (approximately 130 papers each). RAs will use a survey created by the researchers to code each paper in a systematic way. Below is information on how this coding process will be done.

For each paper RAs will report codes in the survey. They can then restart the survey to code a new paper.

Below is information about each question in the survey that RAs will answer while coding:

Page 1 of Survey

On this page, RAs will answer questions about the paper *in general* and not about individual studies.

1. RAs write their own initials so the researchers can track who coded which paper.
2. RAs add paper code (which can be found in the Excel sheet of papers)
3. To ensure the correct paper is being coded, RAs will also include the last name of the first author of the paper.
4. It could be a paper that should not be included in our review was included. For example, the paper is qualitative (instead of quantitative), is not in English, or is not focused on the theme of user comments under news articles (and the effect of these comments). We ask you to let us know if this paper qualifies. If you answer “no” you will be directed to the end of the survey.
5. To ensure the correct paper is being coded, RAs will also add the publication year of the paper. The publication year can be found in the Publication Year column of the Excel sheet. If there is no year, please then check the “Document Type” column—if there it says “Early Access”, enter “Early Access” into the publication year box. If there is no year AND it does not say “Early Access”, please write “NA”.
6. We are also interested if authors cite or mention Habermas (a researcher in the field). RAs will search for Habermas’s name in the paper. If they are mentioned within the text or their name appears in the reference list please answer “Yes”. RAs can check this by hitting “Command” and “F” and searching for the name in the paper.
7. Next RAs will report how many studies are in the paper. Importantly, it could be that there are multiple studies but only a subset of these studies should be included in our review (i.e., studies focused on studying the comments under news content (e.g., relevant content analysis) or how these comments have downstream consequences (e.g., relevant experiments)). In this question, please report ALL studies (even if some should not be included in coding).

Importantly, we are pretty sure all or nearly all papers only include between 1 and 3 studies. However, if RAs find a paper that has more than 5 studies let (1st author) know (and do not code that paper yet) as I will have to make more coding sheets for that paper. This survey is set up to only be able to code up to 5 studies as of now.

Page 2 of Survey

On the second page of the Study RAs will be asked about Study 1 of the paper. Here RAs will report whether Study 1 should be included in the review (i.e., whether it is a relevant study for the review). Relevant studies are studies that in some way assess how comments under news content look (e.g., content analysis) or how such comments affect things (e.g., others’ perceptions of news media, others’ perceptions of public policy, etc).

Page 3 of Survey

On the third page of the survey, RAs will code Study 1.

1. Study Method: RAs will report which study method Study 1 was. If the study was multi-method, please select “Other” and describe the method.

2. Sample Size: RAs report the sample size of the study (only for sample with human participants (i.e., not a content analysis)).

Important: Sometimes researchers will gather a sample but then only analyze a subset of that sample. For example, researchers will gather 500 participants but then people fail attention checks, or do not meet certain criteria, leaving 415 participants who are included in analyses. In this case the sample size would be “415 participants”.

3. Student Sample: If the sample included participants, the researchers are interested in knowing if it is a student sample (i.e., a sample of college/university students). If this question is not applicable (e.g., because the study is a content analysis of newspapers and thus does not have participants), please answer “Not Applicable”. If it is unclear whether the sample is a student sample, please answer “Unclear” and then describe the sample.

4. Representative Sample: If the sample included participants, the researchers are also interested in knowing if it is a representative sample. Representative samples are samples that represent the larger population on a variety of characteristics. For example, a study could have a representative sample of American participants who represent the American population in terms of age, gender, and race (i.e., quota-based sample). This would mean that if in the American population there are 51% women, there would also be approximately 51% women in the study sample.

If this question is not applicable (e.g., because the study is a content analysis of newspapers and thus does not have participants), please answer “Not Applicable”. If it is unclear whether the sample is a representative sample, please answer “Unclear” and then describe the sample.

5. Type of Collection/Coding (if content analysis).

This question is only relevant for content analysis. If not choose “Not Applicable”.

Here we want to know how the content analysis articles/comments were collected and coded. Were they collected and coded by people? Were they collected and coded by both people and automated processes? Were they collected and coded by just automated processes?

5. Country of Sample: The next question relates to what country the sample is from.

Importantly, please do not confuse this with where the researchers/authors are from!

- If your sample is a newspaper or news content then report the country where the news content is from (e.g., New York Times= “United States”).

-If your sample is participants, report what country they are from (e.g., American participants = “United States”).

-If your sample includes multiple countries (e.g., news content from the UK and the US or American and UK participants then report each country... in this case “United States and United Kingdom”).

-If participants are recruited from a website (e.g., like Reddit) but they are not from any specific countries, then write “world-wide web” as the sample

6. News Source: Please write down which news source is studied (e.g., “We explored comments under New York Times news articles”, “We assessed how comments on CNN news clips shaped political hostility”). In these cases, RAs would write down “New York Times” or “CNN” respectively.

-If the news source is not mentioned in the study. Please write “No Source Mentioned”.

Please note, often researchers will report more details in a first study but provide less details in later studies so the paper is less repetitive. For example, in Study 1 they could write “We analyzed the effect of comments under CNN news content” but in Study 2 write “Using the

same stimuli from Study 1”. In this case, in Study 2 the authors are also assessing CNN news content even though they did not explicitly say so. Here CNN news content should be included in the news source coding for the second study.

-If the authors look a long list of news media sources but don’t name them all just describe to your best ability (e.g., a variety of American television news programs).

7. News Content Type: Here RAs should report what type of news content was studied.

8. News or Social Media: Here RAs report whether the news content was on a news platform (e.g., news platform like CNN.com) or whether the news was posted on a social media platform (e.g., a news link posted on Facebook). If WITHIN the Study the authors look at articles that are both on a news site and social media then please select “on both a news site AND social media site”.

9. Social Media: If the news content is on social media, please report what site it is on. If the news content is NOT on social media (e.g., rather on CNN.com) then choose the response “Not Applicable”.

-If the social media site is not one of the listed options, please click “Other” and provide the name of the site. If the name of the social media site is not provided in the paper, then click “Social Media Site not named”.

Please note, often researchers will report more details in a first study but provide less details in later studies so the paper is less repetitive. For example, in Study 1 they could write “We analyzed news content on Facebook” but in Study 2 write “Using the same procedure from Study 1”. In this case, in Study 2 the authors are also assessing content on Facebook even though they did not explicitly say so. In this case you would select “Facebook” for the second study.

10. Topic: Here RAs should provide information about what type of topic the *news content* focuses on. For example, do the researchers study news content/comments about the war in Afghanistan, Black Lives Matter, climate change, etc. RAs should copy and paste the topic into the free response box.

-Keep in mind more details about the topic may be provided in earlier studies and not in later ones. (as mentioned in point 9 above).

11. Incivility: RAs should report whether the study focuses on incivility. The study should specifically study/measure/manipulate incivility. This could include studying how uncivil comments are, how comments make readers more uncivil, or compare how civil and uncivil comment affect others. The authors should specifically use the terms “incivility” or “uncivil”. If these terms are not mentioned in relation to methods/ analyses in anyway then please code as “No”.

12. Behavioral Measure: Report whether there is a behavioral measure (i.e., participants DO something (e.g., sign a petition, write a comment themselves, etc.). This type of measure is different from a self-report measure where participants report their attitudes (e.g., responding to a question like “How do you feel about X” using options like “very negative”, “neither negative nor positive”, “very positive”).

-Behavioral measures will only be present if there are participants in the study. Therefore, if the study does not have participants (e.g., a content analysis), then click “Not Applicable”.

13. Dependent Variable(s): Report the dependent variables (and mediators if applicable) that the study assessed. If there are multiple variables, please report all of them.

-Note that in content analyses these may not be so clear cut (e.g., just report overarching themes or patterns. In this case just describe what they assess to your best ability).

14. Key Finding: Report the central finding of the Study (i.e., their key result). Helpful places to look for these results include the abstract, the study results section, the study’s discussion section, or the beginning of the general discussion section. Reporting this central

finding should be short (max 5 sentences). In some cases, RAs may be able to sum up the results of the study in 1 or 2 sentences.

Importantly, please make sure the results reported here are for THIS study (e.g., Study 1) and not other studies (something to be careful of when reading the abstract and general discussion as in these places multiple studies' findings could be reported in the same paragraph).

15. General Comments: Here RAs can report general questions, comments, or concerns about the Study. If RAs are unsure whether this study should be included in the review, they should report why here.

*** If on page 1 RAs reported there was more than 1 study, they will then see pages 2 and 3 again but this time be asked about Studies 2, 3, etc. Thus, this coding process will be done for each study.

Page 4: General Comments: On the last page of the survey you will see this box where you can add any necessary information that we should know. For example, you can write if there were any issues or mistakes that you want us to know about.

Appendix C. Additional Analyses

Table S1.

Interrater reliability analyses between coders during Stage 2 Coding

Study Qualifies	Mention Habermas	Study Number	Study Type	News Content Type	Social Media	Social Media Type	Incivility	Overall
$\kappa=.87$	$\kappa=.84$	$\kappa=1$	$\kappa=.71$	$\kappa=1$	$\kappa=.77$	$\kappa=.78$	$\kappa=.84$	$\kappa=.89$

Table S2.

Frequency of publications by year.

Publication Year	Frequency
2022	13
2021	37
2020	38
2019	35
2018	27
2017	16
2016	15
2015	22
2014	15
2013	1
2012	5
2011	2
2010	1
2009	3
2008	1

Note: For papers only published as Early Access papers (and not in print) on the day of data retrieval (April 4th 2022)– we checked when those papers were published first online and included that information in the graph above. Of these early access papers; 4 papers were published online first in 2020, 8 in 2021, and 9 in 2022.

Table S3.

Frequency of Samples by Country

Country	Frequency	Country (continued)	Frequency (continued)
United States	100	Canada	2
Germany	46	Spain	2
Korea	18	Azerbaijan	1
United Kingdom	11	Turkmenistan	1
Switzerland	7	Philippines	1
Israel	7	India	1
Australia	5	Indonesia	1
Vietnam	4	Italy	1
China	4	Hungary	1
France	3	Bulgaria	1
Russia	3	Turkey	1
Portugal	3	Kuwait	1
Netherlands	3	Bangladesh	1
Belgium	3	Chile	1
Sweden	3	Estonia	1
Qatar	3	Romania	1
United Arab Emirates	3	Cyprus	1
Finland	3	Denmark	1
Austria	2	New Zealand	1
Nigeria	2	Croatia	1
Japan	2	Norway	1
Serbia	2	Worldwide sample	7
Malaysia	2	Unclear/Not Mentioned	15

Table S4.

Frequency of news sources used in studies.

News Source	Frequency
Spiegel Online	21
New York Times	20
The Washington Post	17
USA Today	15
The Guardian	14
Zeit, Welt (welt.de)	12
Huffington Post	11
Sueddeutsche Zeitung	10
Bild-Zeitung, Associated Press/ AP	9
Focus Online	8
Yahoo News	7
dailymail.co.uk, Ynet, LA Times, Wall Street Journal, Al—Jazeera Arabic/TV	6
Taz, Fox News, Naver	5
telegraph.co.uk, tagesanzeiger.ch, blick.ch, BBC, Tagesschau, CNN	4
nzz.ch, srf.ch, Daum, Tuoi Tre News, Thanhnien, Brietbart, Der Standard, The Atlantic Magazine, Al-Arabiya/TV, ABC News, MSNBC, NBC, CBS News, Chicago Tribune, Slate, rp-online.de	3
lefiagaro.fr, lemonade.fr, leparisien.fr, info.france2.fr, tempsreel.nouvelobs.com/rue89, watson.ch, público, The Economist, Waz, Stuttgarter, Faz, Vanguard, Boston Globe, Forbes Magazine, Wired Magazine, Sotkamo-lehti, Helsingin Sanomat, Kianuun Sanomat, Hankyoren Newspaper, boston.com, Time, New York Post, BuzzFeed, Vice, New York Daily News, examiner.com, Chosun Ilbo, Reuters, The Canadian Newspaper, diepresse.at, Tagesspiel, Aftonbladet, TV2, Arizona Daily Star, Kronen Zeitung, Seattle Times, origo.hu, 888.hu, Pestisracok, Mandiner, index.hu, 444, HVG.hu, 24.hu, Derstandard, Helsingborgs Dagblad, Daily News, IEEE Spectrum Magazine, Scientific American Magazine, Smithsonian Magazine, MIT Tech Review Magazine, Paran News, DaiGorod55, BK55, NGS Omsk, New Matilda, Philippine Daily Inquirer, Jornal de Noticias, Eike, science-skeptical.de, Klimaretter, Klima der Gerechtigkeit, Klimalounge, Klimazwiebel, Google News, ZDF Heute, N24, RTL Aktuell, Health News Review, Petik, Corriere Della Sera, Koppreport, fr-online.de, Het Loatste Nieuws, Juvenile Diabetes Research Foundation JDRF, Nederland and Diabetes Fonds, Delfi Uudised, Eesti Ekspress, Eesti Päevaleht, Postimees, Öhtuleht, SF Gate, El Pais, La Vanguardia, dayoo.com, Gawker, tagesspiegel.de, aargauerzeitung.ch, br.de, Freitag, Handelsblatt, Jurier, Heise, Merkur, Nachrichten, IFLScience.com, oe24.at, TZ, Gandul Daily, Dagens nyheter, Naija news, SZ online, La Nación, el Mercurio, la Tercera, el Tiempo, el Espectador, el universal online, el Comercia, la República, People's Daily, CCTV news, Chronicle of higher education CHE, Inside higher education IHE, Scotsman.com, Aftenposten, Dagbladet, Norsk rikskringkasting NRK, Verdens Gang VG, Expressen, Nyheter24, Sverriges TV, TV4, B.T., Danmarks Radiom Ekstra Bladet, Politiken, el Diario, el Confidencial, el Español, Topix, NPR, procon.org, News Beat, Metro Local, Chosum Daily, Le Monde, Le Figaro, Nurriyet, Radikal, Milliyet, News Sky, ici.fr, Berita Harian, Malaysiakini, Sinar, Harian, The Star, Mail Online, The Verge, Mic, Bleacher Report, CNBC, Bloomberg, National Public Radio, The Week, The Blaze, NDTV, Business Insider, US News and World Report, SciShow, CWB, People Magazine, Heat, usmessageboard.com, Disqus.com, quoara.com, National Geographic, Zeit im bild, 24sata.hr, index.hr, Newsweek, Upworthy, Qatar Tribune, Salon, VDX, Xinhua News Agency, The Daily Beast, For-tune, The Hill, blic.rs, telegraf.rs, HLN, Alaan newspaper, tomo news SU, News channel 5, Japan Broadcasting corporation, Hankyoreh Shinmun, wall.co.il, Espresso, Observador, Australian Broadcasting Corporation, 20 minuten, Schweizer Radio, Fernsehen, EMOL, latercera.com, YTN science, Daily Telegraph, Daily Mirror, The Sun, The Vancouver sun, Fakt aktuell, The Globe and Mail, News channel RT	1
Fictitious Article and/or news site	15
No Source Mentioned	84