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Climate Change Framing
in German Quality and Tabloid Newspapers

Bachelor's Thesis

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Abstract

Climate change is too complex and long-winded to be perceived directly by individuals. This means that the media must put information about climate change into a format that makes the issue newsworthy. This study examined the reflection of news frames in climate change coverage in German news items in tabloid and quality papers. Different frames emphasise different aspects of an issue and this might influence how climate change is constructed socially. A frame analysis following a deductive approach showed that the news frames reflected most often are the attribution of responsibility frame, the issue frame and the (economic) consequence frame. Moreover, this research did not yield any significant differences in news frame use between media outlets. Thus, across media, the public is exposed to information about distinct opinions, responsibility for climate change and any consequences of climate change rather than with news about technological advances or innovation that might pave the way into a future respectful of the climate.

Keywords: Frames, Framing, Tabloid Papers, Quality Papers, Germany

Introduction

Every utterance, every claim that is made by humans is articulated in a certain frame that guides interpretations of both the sender and the recipient of the message. To frame is natural, neither bad nor good and part of our everyday life (Ytterstad, 2015). To understand topics and to generate one's own opinion about it, people are sometimes dependent on the information of others. This also applies to the topic of climate change. The individual cannot perceive the phenomenon directly as it is a long-term development. Nevertheless, to mitigate or to adapt to the consequences of climate change, action by every individual is crucial (Trumbo, 1996). Individuals inform themselves through various channels and, thus, the media play a crucial role in climate change communication. Media content offers orientation in the formation of opinion for everyone, including politicians or other influential persons. In order to discover how climate change is constructed socially, it must be investigated how climate change is presented, be it in digital or classical media (Brüggemann, Neverla, Hoppe, & Walter, 2018).

Frames and Framing

As said, any information that is communicated is framed, intentionally or unintentionally (Nisbet, 2009), meaning that certain aspects of an issue are (being made) more salient (Entman, 1993). A frame helps to make sense of events (Gitlin, 1980) by offering to “locate, perceive, identify and label” (Potthoff, 2012, p. 271). Especially for phenomena that are not directly observable, frames can influence the construction of an issue in the minds of the audience (Potthoff, 2012). According to Entman (1993), frames define problems, diagnose causes, make moral judgements or suggest remedies. It is important to note that several frames or none of the frames identified by Entman (1993) can be present in one text or utterance (Entman, 1993). Furthermore, researchers distinguish between generic and issue-specific frames. Generic frames are defined as frames that are applicable to different issues and present a way of how to depict the media world in general (Brüggemann & Engesser, 2013). In contrast, according to De Vreese (2005), issue-specific frames only apply to specific topics.

Semetko and Valkenburg (2000) merged several theories and frames that had been previously found to be present in US and European news coverage on politics. They found five frames and use these to analyse politics coverage in the Netherlands. The five frames that were identified are the conflict frame, the human interest frame, the economic consequences frame, the morality frame and the responsibility frame. The conflict frame is present when a conflict

between two parties is emphasised whereas with the human interest frame being reflected, an article focuses on emotions, consequences of an issue for individuals and may go into detail concerning the private life of the actors (Semetko & Valkenburg, 2000). When the economic consequence frame is present, the news item focuses on the consequences an issue has on any individual or group. Mostly, these consequences are considered in economic terms. The morality frame presents an issue in the context of “religious tenets or moral prescriptions” (Semetko & Valkenburg, 2000, p. 96). Finally, the responsibility frame is prevalent if a news item focuses on the presentation of an issue with regard to the individual or group who is responsible for the solution or cause of the issue. Semetko and Valkenburg (2000) identified which frame is predominant in a news item by answering questions on a 20-item questionnaire. Other researchers have already based their analysis on the model proposed by Semetko and Valkenburg (2000) and applied it to a variety of topics (D'Haenens & De Lange, 2001; De Vreese, Peter & Semetko, 2001; Kline, Karel & Chatterjee, 2006; Dirikx & Gelders, 2010). For instance, Dirikx and Gelders (2010) used the questionnaire to analyse the frames reflected in French and Dutch newspaper articles regarding the United Nations climate change conferences in the years 2001 until 2007. They found that most often the consequence frame and the attribution of responsibility frame were present. Moreover, their research showed that the human interest frame was only scarcely used.

In addition to the frames defined by Semetko and Valkenburg (2000), Brüggemann and Engesser (2013) suggest three supplementary frames: the progress frame, the risk/disaster frame and the uncertainty frame. They base their decision on the fact that climate change is a topic of interest not only for environmentalists and politicians but also for scientists. With the progress frame being present, a news item focuses on the benefits that technological advancement brings to society. With the risk/disaster frame, a news item focuses on the possible negative outcomes and catastrophes that technology and science bring about. Finally, with the uncertainty frame, a news item focuses on the dubiousness and inconclusiveness of scientific knowledge and claims. Next to adding these frames, the two researchers divide the conflict frame into a conflict and an issue frame. The difference here lies in that a news item can either portray two or more distinct perspectives as incompatible and disagreeing (conflict frame) or merely as differing (issue frame) (Brüggemann & Engesser, 2013). The frames compiled by Semetko and Valkenburg (2000) and Brüggemann and Engesser (2013) can be regarded as generic frames.

How powerful framing can be is exemplified by a well-known experiment conducted by Kahneman and Tversky (1984). Participants had to decide what to do in a dilemma situation

regarding the outbreak of a disease. With the options to choose from being identical and merely the framing being different, participants' decisions differed. This demonstrated that certain framing calls attention to specific aspects and thereby reduces attention to different parts. This said, frames carry importance not only in what they communicate but also in what they do not mention (Entman, 1993).

Climate Change Communication

Climate change is a global phenomenon and a concerning one and therefore receives global attention (Schäfer, Ivanova & Schmidt, 2012). By now, scientists are certain that the "climate is changing faster than in historical past" (Von Storch & Krauss, 2005, p. 2). There is also consent that climate change is in parts caused by greenhouse gas emissions of humans (Neverla & Schäfer, 2010) and it is thus called anthropological climate change. Since the 1970s climate change is covered regularly in the media (Von Storch, Meinke & Claußen, 2017).

Climate change is a long-term phenomenon, which can only partly be recognized directly by humans due to for example extreme weather events. In general, however, media depict events that are of shorter term or surprising events. This is also what environmental journalist Geoffrey Lean argues. He explains that a topic is regularly newsworthy when it concerns an event, presents images or reports about a conflict. In contrast, climate change is a process, it concerns scientific and political arguments more than images and the goal is to reach consensus rather than to report conflict. Therefore, the topic does not follow the regular media logic (Plattner, 2016).

Due to this peculiarity of the topic, media coverage of climate change concentrates on special occasions. For instance, climate change is reported when there are current happenings such as weather extremes which are brought into relation with climate change (Schäfer et al., 2012; Neverla & Schäfer, 2010). Moreover, international events such as the annual United Nations climate change conference are making the issue newsworthy (Schäfer et al., 2012; Neverla & Schäfer, 2010); Neverla & Trümper, 2012). Finally, societal feedback as for example political or scientific activities set the topic on the news agenda (Schäfer et al., 2012; Von Storch et al., 2017). Examples for such occasions in recent times, and during the time frame of this analysis, were the 24th United Nations climate change conference in Katowice, Poland, in December 2018 and the 'Fridays for future' students' demonstrations lead by the 16-year old Greta Thunberg, who became well-known as of her speech at the conference. At the United Nations climate change conference, politicians decided on the rules for bringing the Paris agreement of 2015 into practice, which aims to keep the global temperature increase below 2

degrees compared to the pre-industrial time (Harvey, 2018). The ‘Fridays for future’ demonstrations are a movement by students who strike on Fridays for more action on the climate crisis (FridaysForFuture, n.d.).

In times in which no events take place, alternatives are found in order to make the issue interesting for the public. For instance, the topic is dramatized (Neverla & Schäfer, 2010), sensationalised, the risks are downplayed or exaggerated, or public hysteria is incited. Another way to make the topic accessible to the audience is to construct a link to everyday experiences of individuals (Weingart, Engels & Pansegrau, 2000).

By now, research on climate change communication has developed into an independent research field (Krauß, 2013): to give an example, only in 2014 more than 250 scientific articles on climate communication have been published (Brüggemann et al., 2018). Generally, it is important to translate the complex topic into a format that interests the public and that maximizes their attention (Von Storch et al., 2017; Weingart et al., 2000).

Differences between media outlets

When informing oneself about what is going on in the world, people make use of different mass media channels. One of those are daily newspapers which can be characterized as, among others, quality papers or tabloid papers. Journalistic quality is believed to be based on three aspects. Firstly, journalists are expected to transfer knowledge to the public so that individuals have the opportunity to be well-informed and to participate in societal debates. Secondly, there are some standards that quality items should adhere to such as objectivity, independence or variety (Arnold, 2013). Objectivity involves journalists reporting neutrally, independence entails that journalists can report free of any obligations or impositions and variety indicates that journalists present a rich variety of topics and opinions (Deuze, 2005). Finally, quality can be determined by what the public prefers to read and in fact consumes (Arnold, 2013).

In contrast to quality papers, tabloid papers portray a mixture of factual news, commercial content and political opinion (Beck, Berghofer, Dogruel & Greyer, 2012). Typical strategies to attract attention are sensationalism, personalisation and simplification. The simple understandability, the emotional identification and the high entertainment value are reasons for the huge readership of tabloid papers (Arnold, 2013).

Research has shown that for some topics frame use in articles differs among quality and tabloid papers. Semetko and Valkenburg (2000) for instance found that in the Netherlands more sober and serious quality papers reflected the attribution of responsibility frame and the conflict frame more often in articles covering politics than tabloid papers. On the other hand, the more

sensationalist tabloid papers presented the human interest frame to a greater extent. Similarly, in a study comparing media content in 27 member states of the European Union, Schuck et al. (2013) found a higher proportion of the conflict frame in quality papers compared to tabloid papers. For a different topic, namely the gene subject, Carver, Rodland and Breivik (2013) investigated differences between quality and tabloid papers in a corpus compiled by media content from the United Kingdom, the United States, Norway and France. Quality papers were found to focus more on materialistic and evolutionary framing which means that they tried to make the concept more concrete by comparing it to for instance the alphabet or a book. In contrast, in tabloid papers the symbolic frame was prevalent. Thus, the gene topic was presented in humoristic non-scientific ways with the goal of entertaining instead of informing. For the topic of sustainability, Bonfadelli (2007) found that in quality papers the issue was mostly covered in economic or political terms, whereas in tabloid papers it was presented from a human interest perspective. Generally, he found the topic of sustainability to be less present in tabloid paper articles and explains this with the lack of outstanding individuals (Bonfadelli, 2007). Despite the beforementioned findings, other research did not adduce evidence for such differences. For instance, Greussing and Boomgaarden (2017) did not detect differences between quality and tabloid papers regarding the framing of the refugee crisis. Frame use and frame rank order being (nearly) identical, the only difference between media outlets they found was that generally less of the frames under analysis were prevalent in tabloid papers than in quality papers. To summarise, although research has demonstrated that tabloid papers reflect the human interest frame to a greater extent and quality papers focus more on attribution of responsibility, conflict and (economic) consequences, there are studies that negate such a difference.

Research questions

It is clear that the topic of climate change is of societal relevance. In order to prevent a high rise in the average global temperature, action on an international level is necessary. Germany, as a big player in the European Union, contributes to policies regarding climate change prevention. Parties that want to exercise influence over such policies are dependent on votes of the general public, thus of individuals who retrieve information amongst others from leading newspapers. In order to investigate which perspective on climate change the media portray, the following research question is asked:

RQ 1: Which news frames are predominantly used in German news items covering climate change before, during and following the Katowice climate change conference in December 2018?

Moreover, information and its framing might differ based on the media outlet that an individual decides to consume. To date, German news items covering climate change have not been investigated in terms of frame use differences among media outlets. Research in other countries and for other topics has produced ambivalent findings. Therefore, no hypothesis for the results of this study is made, but the following research question guides the research:

RQ 2: How do predominant news frames relate to the type of media outlet (quality paper vs. tabloid paper)?

Method

Material

In order to investigate how climate change is framed and whether framing differs in distinct media outlets, a corpus analysis was conducted. News items published in two German nationwide and daily newspapers discussing the topic of climate change were analysed. The two newspapers selected were *Süddeutsche Zeitung* and *BILD-Zeitung*. Both are regarded as leading media with high circulation (Schäfer, 2007). The *Süddeutsche Zeitung* is regarded a quality paper whereas the *BILD* is regarded a tabloid paper (Potthoff, 2012; Brüggemann & Engesser, 2014; Haßler, Maurer & Oschatz, 2014; Engesser et al., 2014). The *Süddeutsche Zeitung* published their first paper on the 6th of October 1945. Since then, it is published every day except for Sunday (Zeitung.de, n.d. a) and its paid circulation in the first quarter of 2019 was around 338.000 copies (Statista, 2019 a). Seven years later, the publisher Axel Springer published the first *BILD* on the 24th of June 1952 (Bild.de, n.d.). It is also a daily paper and has a special Sunday edition called '*BILD am Sonntag*' (Zeitung.de, n.d. b). With a paid circulation of 1,48 million in the first quartal of 2019, *BILD* is the newspaper with the widest circulation in Germany (Statista, 2019 b).

As mentioned, research has found that climate change communication peaks during international events or for instance when extreme weather events are happening. For this analysis, the United Nations climate change conference in Katowice, which took place from the

2nd of December 2018 until the 14th of December 2018, was considered when choosing the time frame for analysis. As there were not enough articles available for a solid analysis only in the time frame of the conference, the time frame before, but mainly afterwards was extended. Many articles published weeks or even months after the conference still refer to the event or its outcomes. Therefore, the time frame for data collection was: 26.11.2018 – 15.02.2019.

Articles of the *BILD* were collected on their topic website regarding climate change and global warming whereas articles of the *Süddeutsche Zeitung* were collected from Nexis Uni. On Nexis Uni, it was searched for articles containing the words “Klimawandel” (climate change) and/or “Erderwärmung” (global warming) and/or “Treibhauseffekt” (greenhouse effect) with the source set to *Süddeutsche Zeitung*. This word-search is in line with how Dirikx and Gelders (2010) and Brüggemann and Engesser (2013) searched for their research material. It was checked for every article individually, whether the topic of the article regarded climate change, i.e. climate change was mentioned in the headline, lead or the first paragraphs. Moreover, articles which merely focused on pictures and descriptions of them were excluded. The resulting number of articles for each newspaper in the given timeframe was 30 for the *BILD* and 36 for the *Süddeutsche Zeitung*. For this analysis, the sufficient number of articles for each newspaper was set to 30, in line with what Van Voorhis and Morgan (2007) regard as the minimum. 30 articles of the 36 *Süddeutsche Zeitung* articles were selected by using simple random sampling. The unit of analysis and of coding was the whole article, just like in Dirikx and Gelders’s (2010) research.

Model of analysis

To code which frames were reflected in every article, a deductive approach was used. This means that the frames that were investigated were pre-defined (De Vreese, 2005). An adapted version of the 20-question sheet developed by Semetko and Valkenburg (2000) was used. As this analysis does not focus on visual information contained in a story item, one question underlying the human interest frame was left out. Although Dirikx and Gelders (2010) have used the frames defined by Semetko and Valkenburg (2000) and applied it to the topic of climate change, Brüggemann and Engesser (2013) suggest including three additional frames: a progress frame, a risk/disaster frame and an uncertainty frame. Moreover, Brüggemann and Engesser (2013) divide the conflict frame into a conflict frame and an issue frame. As Brüggemann and Engesser (2013) did not conduct a frame analysis but focus on journalists’ opinions, they do not propose with which questions to measure the additional frames in a content analysis. Following Brüggemann and Engesser’s (2013) advice, the question sheet by

Semetko and Valkenburg (2000) was adapted and added by the proposed frames with underlying questions (see Appendix A).

Questions to measure the additional frames were developed focusing on previous literature. Thereby, definitions that prevailed literature were turned into closed-ended questions. For instance, Lawrence (2000) described the issue frame to present “stories about public policy problems” (Lawrence, 2000, p. 100) and “descriptions of politicians’ stands or statements on policy issues” (Lawrence, 2000, p 100). Resulting questions were: ‘Does the story present public policy problems?’ and ‘Does the story describe politicians’ stands or statements on policy issues?’. This procedure of turning definitions given in literature into questions was used for every frame. Thereby, the issue frame was based on Brüggemann and Engesser (2013) and Lawrence (2000), the progress frame was based on Lively and Conroy (2013), Weaver, Lively and Bimber (2009) and Bauer, Durant and Gaskell (1998), the risks/disaster frame was based on Brüggemann and Engesser (2013), Weaver et al. (2009), Nisbet (2009) and Bauer et al. (1998), and the uncertainty frame was based on definitions in Brüggemann and Engesser (2013), Nisbet (2009) and Shehata and Hopmann (2012). For every frame, four or five questions were developed in order keep the number of questions comparable to the number of questions used by Semetko and Valkenburg (2000) and to maximise the chance that the questions represent the construct well. Also, none of the questions was exclusively focussing on the topic of climate change in order to also be applicable to other (scientific) topics.

To give examples for all frames, the question “Does the story suggest that some level of government is responsible for the issue/problem?” reflects the attribution of responsibility frame (five questions), “Does the story provide a human example or ‘human face’ on the issue?” reflects the human interest frame (four questions), “Does the story describe politicians’ stands or statements on policy issues?” reflects the issue frame (four questions), “Does the story reflect disagreement between parties/individuals/groups/countries?” reflects the conflict frame (three questions), “Does the story make reference to morality, God, and other religious tenets?” reflects the morality frame (three questions) and the question “Is there a mention of (financial) losses or gains now or in the future?” is one item measuring the (economic) consequence frame (three questions). One of the five questions measuring the progress frame is “Does the story present technological advances as beneficial for the society?” and in order to measure the risks/disaster frame four questions are used, such as “Does the story associate innovation with risks?”. Finally, one of the four questions measuring the uncertainty frame is “Does the story present the issue as not being based on confirmed knowledge?”.

Procedure

By answering all questions for each article, it was possible to identify the frame that was predominant in an article. Two coders content-analysed articles and answered all questions of the questionnaire for each article with one coder coding all articles and the second coder coding 20%, thus 12 articles. Both coders were native speakers of German. The inter-coder reliability was assessed calculating Cohen's Kappa for each of the questions answered for the 12 articles that were coded by both coders. There was an good agreement between the two coders with the mean $\kappa = .831$, and values ranging from $\kappa = .385$ to $\kappa = 1.00$. In percentages, the average coder-reliability value was 93,8%, ranging from 66,7% to 100% (for detailed data, see Appendix D).

Articles were coded by answering the questions with 'yes' or 'no'. 'Yes'-answers were coded with 1 and 'no'-answers were coded with 0. For each frame, the answers were averaged which resulted in a frame mean score. Frame mean scores of .00 signified that the frame was not present at all and frame mean scores of 1.00 signified that the frame was clearly present. Thus, the higher the frame mean score, the more predominant the frame in an article. For the present analysis, an average of 0.5 was regarded as the threshold value for a frame to be labelled as 'present' in an article.

Statistical treatment

In order to conduct statistical tests, it is necessary to be aware of the measurement levels of the variables. Media outlet was a nominal independent variable with two levels (quality papers, tabloid papers) and news frame was a dependent ratio variable with nine levels (conflict frame, issue frame, human interest frame, (economic) consequence frame, responsibility frame, morality frame, progress frame, risk/disaster frame, uncertainty frame).

For the newly developed questions, Cronbach's alpha was calculated to test if the questions explain the frames in a good manner. All newly developed frames had acceptable reliabilities. Cronbach's alpha values were .77 for the issue frame, .75 for the progress frame and .79 for the uncertainty frame. For the risk/disaster frame no alpha value could be calculated as this frame was not present in any article and no question could be answered with 'yes'. Although the remaining frames and their underlying questions had already been found to be reliable in several other research, there were tested again for this analysis. The analysis revealed that some frames were based on unreliable items, with Cronbach's alpha values being .70 for the attribution of responsibility frame, .66 for the human interest frame, .66 for the morality frame, .42 for the conflict frame and .33 for the (economic) consequence frame.

To investigate which frames were predominant in the articles, frame frequency counts were analysed. Moreover, to find out to what extent news frames differ between distinct media outlets, t-tests, chi-square tests and Mann-Whitney tests were conducted.

Results

Predominant frames

Several questions were used to analyse pre-defined news frames and for each article and each frame a frame mean score was calculated. This was done by calculating the mean of the answers to the questions that belonged to one frame. To facilitate comparability between frames on a general level, the means of the article-specific frame mean scores were calculated. Regarding the first research question, the frame analysis showed that the attribution of responsibility frame ($M = .34$), the issue frame ($M = .32$) and the (economic) consequence frame ($M = .32$) were the frames that were reflected to the greatest extent in the articles. Also, the human interest frame ($M = .28$) and the conflict frame ($M = .25$) were used quite often. In contrast, the uncertainty frame ($M = .07$), the morality frame ($M = .06$) and the progress frame ($M = .01$) were found to be present in articles only scarcely. The risk/disaster frame was not reflected in any article and no question underlying the frame could be answered affirmatively so it is excluded from further analysis.

A frame was labelled as being 'present' when the frame mean score was equal to or above 0.5. According to this categorization, the frames that were present the most were the attribution of responsibility frame, the issue frame and the human interest frame.

Table 1. Frame mean scores and frequency of articles in which respective frame is labelled as 'present' ($M > .50$) for each frame

	<i>M</i> n = 60	<i>SD</i> n = 60	Frequency of articles with <i>M</i> > .50
Attribution of responsibility	.34	.31	24 (40%)
Issue	.32	.36	22 (37%)
(Economic) Consequence	.32	.30	14 (23%)
Human interest	.28	.31	20 (33%)
Conflict	.25	.29	12 (20%)
Uncertainty	.07	.19	6 (10%)
Morality	.06	.18	4 (7%)
Progress	.01	.08	1 (2%)

Note. For *M*: .00 = frame not present, 1.00 = frame clearly present.

For all frames, the mode, thus the value that appeared most often was .00, except for the (economic) consequence frame, for which the mode was .33. The latter means that in many articles at least one of the three questions underlying the (economic) consequence frame could be answered affirmatively. Analysing each (economic)consequence question, the mode for each question was also .00. However, for the third (economic) consequence question, the mean was the highest ($M = .48$). In nearly half of all articles, the question “Is there a reference to (economic) consequences of pursuing or not pursuing a course of action?” could be answered affirmatively.

Differences between media outlets

In order to answer the second research question, thus whether there were statistically significant differences between the two media outlets, an independent samples t-test has been conducted. As can be seen in table two, the independent samples t-tests showed no significant difference between the *BILD* and the *Süddeutsche Zeitung* with regard to the use of the attribution of responsibility frame, the human interest frame, the conflict frame, the issue frame, the morality frame, the (economic) consequences frame, the progress frame nor the uncertainty frame (p 's > .059).

Table 2. Results of independent samples t-tests with means, standard deviations and p-values for each news frame as a function of type of media outlet

	BILD		Süddeutsche Zeitung		
	n = 30		n= 30		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Attribution of responsibility	.33	.30	.35	.32	.869
Issue	.31	.35	.33	.37	.790
(Economic) Consequence	.24	.29	.39	.29	.059
Human Interest	.34	.33	.22	.28	.122
Conflict	.28	.29	.22	.28	.456
Uncertainty	.06	.19	.08	.20	.743
Morality	.06	.18	.06	.18	1.00
Progress	.01	.04	.02	.11	.530

Note. For *M*: .00 = frame not present, 1.00 = frame clearly present.

For the t-test, the frame mean scores were used. However, every frame was also split into two categories, one to which all articles belong in which the frame was not labelled as ‘present’ (frame mean score inferior to 0.5) and one with articles in which the respective frame was labelled as ‘present’ (frame mean score equal or greater than 0.5). A chi-square analysis was conducted to investigate whether there were significant differences between the two media outlets concerning these categories. As can be seen in table three, the chi-square tests showed no significant relation between media outlet and the attribution of responsibility frame, the human interest frame, the conflict frame, the issue frame, the morality frame, the (economic) consequences frame, the progress frame nor the uncertainty frame (p 's > .067).

Table 3. Results of Chi-square tests with article frequencies, standardized residuals and p-values for each frame as a function of type of media outlet

	<i>BILD</i>		<i>Süddeutsche Zeitung</i>		<i>p</i>
	Not present	Present	Not present	Present	
Attribution of responsibility	20 (.5)	10 (-.6)	16 (-.5)	14 (.6)	.292
Human interest	18 (-.4)	12 (.6)	22 (.4)	8 (-.6)	.273
Conflict	23 (-.2)	7 (.4)	25 (.2)	5 (-.4)	.519
Issue	21 (.5)	9 (-.6)	17 (-.5)	13 (.6)	.284
Morality	28 (.0)	2 (.0)	28 (.0)	2 (.0)	1.00
(Economic) Consequence	26 (.6)	4 (-1.1)	20 (-.6)	10 (1.1)	.067
Progress	30 (.1)	0 (-.7)	29 (-.1)	1 (.7)	.313
Uncertainty	28 (.2)	2 (-.6)	26 (-.2)	4 (.6)	.389
Total	194	46	183	57	

Although neither the t-tests nor the chi-square tests detected any differences between the media outlets, Mann-Whitney tests were conducted to investigate whether the proportion of presence of frames differed between media outlets. Indeed, a Mann-Whitney test indicated that for the (economic) consequence frame, the mean rank of the *Süddeutsche Zeitung* (*Mean rank* = 34.93) was significantly higher than that of the *BILD* (*Mean rank* = 26.07), $U = 317$, $z = -2.10$, $p = .036$, $r = -.27$. This means that the proportion of presence of the (economic) consequence frame is higher in the *Süddeutsche Zeitung* than in the *BILD*. For the attribution of responsibility frame, the human interest frame, the conflict frame, the issue frame, the morality frame, the progress frame and the uncertainty frame, Mann-Whitney tests did not detect any significant differences between the two media outlets (p 's > .125).

Conclusion and Discussion

Conclusion

By investigating frame use in news items about climate change, one can detect how the topic of climate change is presented in the media. This representation might impact how climate change is constructed and understood socially (Brüggemann, Neverla, Hoppe, & Walter, 2018; Stehr & Von Storch, 1995). In the present study, by means of a frame analysis, based on an

adapted version of the questionnaire by Semetko and Valkenburg (2000), news frames in 60 German news items covering the topic of climate change were analysed. Moreover, attention was paid to whether news frames differed depending on the media outlet in which the news item was published. The analysis revealed that the frame that was reflected most often in articles was the attribution of responsibility frame, closely followed by the issue frame and the (economic) consequence frame. Also, the human interest frame and the conflict frame were displayed in several articles, whereas the uncertainty frame, the morality frame and the progress frame were present merely to a limited extent and the risk/disaster frame was not present in any article.

Regarding the second research question, no significant differences between tabloid paper and quality papers regarding the presence of news frames in climate change communication were detected. The only statistically significant difference that was found was that in the *Süddeutsche Zeitung* the proportion of presence of the (economic) consequence frame was higher than in the *BILD*.

Discussion

Answers to the first research question, thus which news frames dominate German news items covering climate change, are roughly in line with previous research on climate change news coverage. For instance, for news items covering climate change in France and the Netherlands, Dirikx and Gelders (2010) also found the attribution of responsibility frame and the (economic) consequence frame to be reflected to the greatest extent. They further observed the human interest frame to be reflected in articles only to a limited extent and explain that this might be due to their analysis focusing on quality papers. This argument can be refuted with a look on the results of the present study as no differences between quality and tabloid papers with regard to the presence of the human interest frame could be detected. Brüggemann and Engesser (2013) provide an alternative explanation for the scarce use of the human interest frame: Dirikx and Gelders (2010) only focused on the conferences of the parties for their content analysis and the human interest frame might simply not be dominant in communication about these events. Findings of the present study support this hypothesis as the corpus did not merely consist of news items covering the climate change conference and simultaneously the human interest frame was found to a greater extent in comparison to other frames than in Dirikx and Gelders' (2010) research. Nevertheless, the human interest frame seems to remain a frame subject to change for different topics as for instance Greussing and Boomgaarden (2017) found that, contrary to expectations, the human interest frame was not reflected to a great extent in

communication regarding refugees either. In Semetko and Valkenburg's (2000) study, the human interest frame was also not among the most present frames. They found the attribution of responsibility frame to be present most often, followed by the conflict frame, the (economic) consequence frame, the human interest frame and the morality frame. Although the conflict frame ranks only in the middle field of the predominant frames in the present analysis, the issue frame ranks second which can, in a less strict version, be compared to the conflict frame.

For this analysis, the framework by Semetko and Valkenburg (2000) was added by frames proposed by Brüggemann and Engesser (2013). The latter, in their study, asked journalists from five countries, Germany included, which news frames they regard as important when communicating climate change. What they observed was that for journalists the risk frame was important whereas the uncertainty frame was regarded as the journalistically least relevant frame. Thus, journalists regarded emphasizing the risks of climate change as most important and talking about the uncertainty of climate change research as least important (Brüggemann & Engesser, 2013). These findings cannot be supported with the findings of the present analysis, which can be either explained by a discrepancy between journalists' values and preferences and their actual work, or by a misunderstanding of the frames. Especially the latter can be supposed for this study. The risk frame in the present study was prevalent if a news item portrayed risks connected to technology or innovation. However, in Brüggemann and Engesser's (2013) research, the journalists understood the risk frame as being used when communicating the risks of climate change. Such risks attributed to climate change were not captured by the risk frame in the present study, but rather by the (economic) consequence frame. Thus, the discrepancy between the results of the present study and the results of Brüggemann and Engesser's (2013) study most likely is due to a different interpretation of the risk frame. However, no matter by which frame captured, presenting the risks and consequences of climate change was found to be important in both studies.

The additional frames proposed by Brüggemann and Engesser (2013), namely the progress frame, the risk frame and the uncertainty frame, were not found to be prevalent in the analysed news items. As these frames were previously identified in science communication, it shows that climate change communication in the news can in most cases not be classified as science communication, although climate change is a scientific issue. Moreover, the absence of the risk and in most parts also the progress frame could be interpreted as a lack of innovation and advance regarding climate change. In almost none of the articles, solutions regarding new technology or innovation with which to alleviate climate change were presented. Mostly, when

change was discussed it was merely argued how already existing policies or actions can be adapted or changed.

Concerning tabloid and quality papers, no differences in the prevalence of news frames could be found. Previous research on such differences is ambivalent. Although differences between media outlets have been found in foregoing research (Carver et al., 2013; Schuck et al., 2013), these results were found for different topics, for instance for the gene topic (Carver et al., 2013). Conversely, for instance, Greussing and Boomgaarden (2017) did also not detect any differences between tabloid and quality papers regarding news frames reflected in communication about the refugee crisis. However, their research was based on different frames, a different topic and a different country.

In their study, Greussing and Boomgaarden (2017) discovered the frame rank order of quality and tabloid papers to be identical except for one frame at the lower end of the ranking of both media outlets. In contrast, in the present study, the frame rank order of the *Süddeutsche Zeitung* and of the *BILD*, based on the categories with which articles were labelled as ‘present’ or ‘not present’, differed quite substantially. There were two frames for which the ranks were different by more than one rank between the papers: the human interest frame and the (economic) consequence frame. In the rank order of the *BILD*, the human interest frame ranked first, which means that of all frames the human interest frame was present most frequently. In the *Süddeutsche Zeitung*, the human interest frame merely ranked fourth with the attribution of responsibility frame, the issue frame and the (economic) consequence frame being present more frequently. Although not statistically proven, this suggests that in *BILD*’s news items regarding climate change the human interest frame was emphasised to a greater extent, and was thus portrayed as more important than in the *Süddeutsche Zeitung*. This interpretation of the data confirms what other authors claimed as well. Only to give an example: In their book about tabloid papers, Sparks (2000) and others point out the importance and essence of human interest stories in tabloid papers. Another difference regarding frame rank order is that in the *Süddeutsche Zeitung* the (economic) consequence frame is at third place, whereas in the frame rank order of the *BILD* the frame merely ranks fifth. Also a statistical test detected a significant difference between the papers regarding the (economic) consequence frame. In news items of the *Süddeutsche Zeitung*, there was a higher proportion of presence of the (economic) consequence frame than in the *BILD*. It can thus be reasoned that in the *Süddeutsche Zeitung* the (economic) consequence frame has a higher significance than in the *BILD*.

As this research did not show any statistically significant differences between German tabloid and quality papers with regard to news frames, but the data do suggest a difference in

importance of some frames, the findings support the ambivalent research field in this matter. Nevertheless, there might be differences between media outlets in aspects not covered by frame analyses or rather this model of analysis. The frames, for instance, do not capture any tonality of the articles. One way of capturing tonality of a news item is to assess the expressed negativity. According to Lengauer, Esser and Berganza (2012), negativity in news can be articulated by negative tonality, pessimistic outlook, focus on conflict and/or focus on incapability and misconduct. Engesser et al. (2014) found negativity in news to differentiate between media outlets. Contrary to prevalent expectations, tabloid papers, especially the *BILD*, were found to report the least negative and even the most positive. This positiveness is surprising as generally the sensationalist writing style of tabloid papers is associated with high levels of negativity (Engesser et al., 2014). Also articles analysed in the present research contained aspects of negativity. For instance, both *BILD* and *Süddeutsche Zeitung* reported about the brown coal mining in the same way. Germany was presented as not being capable of dealing with the future of brown coal mining and as not being able to find solutions to the climate crisis. Thus, the dimension of incapability was reflected (for example extracts see Appendix C). Nevertheless, in order to thoroughly judge any similarities or differences between the media outlets, a detailed analysis is needed comparing extent of negativity and topics prone to negativity.

Next to writing style and tonality, this frame analysis does not capture differences in topic selection between tabloid and quality papers. Although it is argued that tabloid papers present more information about prominent people, catastrophes, sports and crime than about politics and economy (Koth, 2009), a detailed analysis is missing.

Statistical tests have shown, that for some items and frames Cohen's Kappa and Cronbach's alpha values were not acceptable. For the inter-coder reliability, this applies to items covering the (economic) consequence frame, the issue frame and the human interest frame. Unacceptable coder reliability was probably mainly caused by miscommunication. For instance, for the second question underlying the human interest frame, the second coder thought that only if the feelings explicitly mentioned in the question were present, the question could be answered affirmatively. What the question entailed though, was rather if any feeling was triggered.

Also, Cronbach's alpha was unacceptable for the human interest frame, the conflict frame, the (economic) consequence frame and the morality frame, although these frames have been used in previous studies and have been proven to be reliable. Low Cronbach's alpha might be caused by the fact that several aspects were measured with the questions underlying one frame. For instance, regarding the conflict frame, a story might present disagreement between

two parties (first conflict frame question), but this does not automatically mean that one of them reproaches the other (second conflict frame question).

Using pre-defined and commonly studied frames for the analysis enables to compare results of this study to others. Moreover, this research investigated an aspect which has not yet been analysed for the topic of climate change in German news coverage: possible differences between media outlets. Nevertheless, as any research, this study had its limitations which result in suggestions for further research. Firstly, although the pre-defined frames used for this analysis have been found to be the most dominant ones, there might be others which were disregarded. Moreover, the analysis merely content-analysed two papers. Although the *BILD* and the *Süddeutsche Zeitung* belong to the most important papers in Germany, there are others, for which findings might differ. Thus, a qualitative inductive research with different or additional papers could enrich findings of this research. Especially the human interest frame seems to trigger ambivalent findings so that it would be interesting to examine this frame for different topics and papers. As indicated in this section, there might be differences between media outlets other than frame use, which could be investigated in further analysis. Another suggestion for future research is to analyse which effect news frame use such as indicated by this research, has on the readers of a news items. Although D'Angelo (2002) argues that those frames that dominate news are considered to also be the ones that dominate audience's thinking, the effect of a news item can differ quite substantially based on the audience's understanding of the discussed issue (Plattner, 2016). As Entman (1993) puts it: "Because salience is a product of the interaction of texts and receivers, the presence of frames in the text, as detected by the researchers, does not guarantee their influence in audience thinking" (p. 53).

This analysis showed that in Germany in both tabloid and quality papers, the attribution of responsibility frame, as well as the (economic) consequence frame and the issue frame, predominate news items. To interpret these results on a larger scale one may ask: What does this reveal about our society and its media world? We are presented with news concerning consequences, differing opinions and assignment of guilt rather than with ways how to change for the better – with ways that do not merely rely on little adaptation of or additions to the current policy system. To give an example: not only shall the media discuss CO₂ taxes, but rather how to change and reface the mobility sector. In news items, the progress and the risk/disaster frame should be reflected to a greater extent. This would entail that innovation and technological advances take place and are emphasised through media. To conclude, what can be reasoned from the results of the present research is that what is needed in order to prevent

climate change and to protect the planet (note: not 'our' planet) are new ideas, creative thinking and individuals that inform themselves critically.

References

- Arnold, K. (2013). Die Qualität der BILD-Zeitung. Journalistische Leistungskriterien und die Boulevardpresse [The quality of the BILD newspaper. Journalistic performance criteria and the tabloid press]. *Zeitschrift für Kommunikationsökologie und Medienethik*, 13(1), 43-48.
- Bauer, M. W., Durant, J., & Gaskell, G. (Eds.). (1998). *Biotechnology in the public sphere: a European sourcebook*. London: Science Museum.
- Beck, K., Berghofer, S., Dogruel, L., & Greyer, J. (2012). *Wirtschaftsberichterstattung in der Boulevardpresse*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Bild.de (2018). Euch gehen Entschuldigungen aus, uns die Zeit [You run out of excuses, we run out of time]. Retrieved May 10, 2019 from <https://www.bild.de/bild-plus/politik/ausland/politik-ausland/klimagipfel-in-kattowitz-greta-thunberg-haelt-ehrlichste-rede-59055336,view=conversionToLogin.bild.html>
- Bild.de (n.d.). 60 Jahre BILD – Die Geschichte der Zeitung [60 years of BILD – The history of the newspaper]. Retrieved March 20, 2019 from <https://www.bild.de/digital/bild-zeitung-druck/bild-druck/fg-geschichte-19082144.bild.html>
- Bonfadelli, H. (2007). Nachhaltigkeit als Herausforderung für Medien und Journalismus. In Kaufmann, R., Burger, P., & Stoffel, M. (eds), *Nachhaltigkeitsforschung-Perspektiven der Sozial-und Geisteswissenschaften/Recherche dans le domaine du développement durable-perspectives des sciences sociales et humaines*. Bern: Schweizerische Akademie der Geistes-und Sozialwissenschaften SAGW.
- Brüggemann, M., & Engesser, S. (2013). Climate journalists as interpretive community: Identifying transnational frames of climate change. *Challenges to Democracy in the 21st Century*.
- Brüggemann, M., & Engesser, S. (2014). Between consensus and denial: Climate journalists as interpretive community. *Science Communication*, 36(4), 399-427.
- Brüggemann, M., Neverla, I., Hoppe, I., & Walter, S. (2018). Klimawandel in den Medien [Climate change in the media]. *Hamburger Klimabericht–Wissen über Klima, Klimawandel und Auswirkungen in Hamburg und Norddeutschland* (pp. 243-254). Springer Spektrum, Berlin, Heidelberg.
- Carver, R. B., Rødland, E. A., & Breivik, J. (2013). Quantitative frame analysis of how the gene concept is presented in tabloid and elite newspapers. *Science Communication*, 35(4), 449-475.

- D'Angelo, P. (2002). News framing as a multiparadigmatic research program: A response to Entman. *Journal of Communication*, 52(4), 870-888.
- De Vreese, C. H. (2005). News framing: Theory and typology. *Information Design Journal & Document Design*, 13(1), 51-62.
- De Vreese, C. H., Peter, J., Semetko, H. A. (2001). Framing politics at the launch of the Euro: A cross-national comparative study of frames in the news. *Political Communication*, 18(2), 107-122.
- Deuze, M. (2005). What is journalism? Professional identity and ideology of journalists reconsidered. *Journalism*, 6(4), 442-464.
- D'Haenens, L., & De Lange, M. (2001). Framing of asylum seekers in Dutch regional newspapers. *Media, Culture & Society*, 23(6), 847-860.
- Dirikx, A., & Gelders, D. (2010). To frame is to explain: A deductive frame-analysis of Dutch and French climate change coverage during the annual UN Conferences of the Parties. *Public Understanding of Science*, 19(6), 732-742.
- Engesser, S., Esser, F., Reinemann, C., Scherr, S., Matthes, J., & Wonneberger, A. (2014). Negativität in der Politikberichterstattung. Deutschland, Österreich und die Schweiz im Vergleich [Negativity in politics coverage. A comparison of Germany, Austria and Switzerland]. *M&K Medien & Kommunikationswissenschaft*, 62(4), 588-605.
- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51-58.
- FridaysForFuture (n.d.). About #FridaysForFuture. Retrieved May 20, 2019 from <https://www.fridaysforfuture.org/about>
- Gitlin, T. (1980). *The Whole World is Watching*. Berkeley: University of California Press.
- Greussing, E., & Boomgaarden, H. G. (2017). Shifting the refugee narrative? An automated frame analysis of Europe's 2015 refugee crisis. *Journal of Ethnic and Migration Studies*, 43(11), 1749-1774.
- Harvey, F. (2018). What was agreed at COP24 in Poland and why did it take so long?. Retrieved May 20, 2019 from <https://www.theguardian.com/environment/2018/dec/16/what-was-agreed-at-cop24-in-poland-and-why-did-it-take-so-long>
- Haßler, J., Maurer, M., & Oschatz, C. (2014). Media logic and political logic online and offline: The case of climate change communication. *Journalism Practice*, 8(3), 326-341.
- Kahneman, D. & Tversky, A. (1984). Choice, values, and frames. *American Psychologist*, 39, 341-350.

- Kline, S. L., Karel, A. I., & Chatterjee, K. (2006). Covering adoption: General depictions in broadcast news. *Family Relations*, 55(4), 487-498.
- Koth, M. E. (2009). *Von der Katastrophe zur Sensation [From catastrophe to sensation]* (Doctoral dissertation, University of Vienna, Vienna, Austria). Retrieved March 20, 2019 from http://othes.univie.ac.at/6440/1/2009-07-14_0205620.pdf
- Krauß, F. (2013). Klimawandel kommunizieren: die richtigen Framings, Formate und Zielgruppen [Communicating climate change: the correct framing, formats and target groups]. In Müller, K.-D. (eds), *Wissenschaft in der digitalen Revolution* (pp. 105-134). Wiesbaden: Springer VS
- Lawrence, R. G. (2000). Game-framing the issues: Tracking the strategy frame in public policy news. *Political Communication*, 17(2), 93-114.
- Lengauer, G., Esser, F., & Berganza, R. (2012). Negativity in political news: A review of concepts, operationalizations and key findings. *Journalism*, 13(2), 179-202.
- Lively, E., & Conroy, M. (2013). 11 news media frame novel technologies in a familiar way. *The Social Life of Nanotechnology*, 18, 223-240.
- Neverla, I., & Schäfer, M. (2010). Das Medienklima. Relevanz und Logik der Medienberichterstattung über den anthropogenen Klimawandel [The media climate. Media coverage's relevance and logic of the anthropological climate change]. *Mitteilungen der Deutschen Meteorologischen Gesellschaft*, 2010, 9-12.
- Neverla, I., & Trümper, S. (2012). Journalisten und das Thema Klimawandel: Typik und Probleme der journalistischen Konstruktionen von Klimawandel [Journalists and the topic of climate change: Typology and problems of the journalistic construction of the climate change]. In Neverla, I. & Schäfer, M.S. (eds), *Das Medien-Klima* (pp. 95-118). Wiesbaden: VS Verlag für Sozialwissenschaften.
- Nisbet, M. C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment: Science and Policy for Sustainable Development*, 51(2), 12-23.
- Plattner, L. (2016). *Climate change communication during COP21 in Paris: The momentum for change framed by the Guardian* (Master's thesis, Uppsala University, Uppsala, Sweden). Retrieved March 20, 2019 from <http://www.diva-portal.org/smash/record.jsf?pid=diva2:1037442>
- Potthoff, M. (2012). *Medien-Frames und ihre Entstehung [Media frames and their origin]*. Wiesbaden: Springer VS.

- Schäfer, M. S. (2007). *Wissenschaft in den Medien: die Medialisierung naturwissenschaftlicher Themen [Science in the media: the increased role of new forms of media of natural scientific topics]*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Schäfer, M. S., Ivanova, A., & Schmidt, A. (2012). Issue-Attention: Mediale Aufmerksamkeit für den Klimawandel in 26 Ländern [Issue-Attention: Media attention for the climate change in 26 countries]. In Neverla, I. & Schäfer, M.S. (eds), *Das Medien-Klima* (pp. 121-142). Wiesbaden: VS Verlag für Sozialwissenschaften.
- Schuck, A. R., Vliegthart, R., Boomgaarden, H. G., Elenbaas, M., Azrout, R., van Spanje, J., & De Vreese, C. H. (2013). Explaining campaign news coverage: How medium, time, and context explain variation in the media framing of the 2009 European parliamentary elections. *Journal of Political Marketing*, 12(1), 8-28.
- Semetko, H. A., & Valkenburg, P. M. (2000). Framing European politics: A content analysis of press and television news. *Journal of Communication*, 50(2), 93-109.
- Shehata, A., & Hopmann, D. N. (2012). Framing climate change: A study of US and Swedish press coverage of global warming. *Journalism Studies*, 13(2), 175-192.
- Sparks, C. (2000). Introduction: The Panic over Tabloid News. In Sparks, C. & Tulloch, J. (eds), *Tabloid Tales: Global Debates over Media Standards* (pp. 1-40). Lanham: Rowman & Littlefield Publishers, Inc.
- Statista (2019 a). Verkaufte Auflage der Süddeutschen Zeitung vom 4. Quartal 2010 bis zum 1. Quartal 2019 [Paid circulation of the Süddeutsche Zeitung from the fourth quarter of 2010 until the first quarter of 2019]. Retrieved May 28, 2019 from <https://de.statista.com/statistik/daten/studie/382110/umfrage/auflage-der-sueddeutschen-zeitung/>
- Statista (2019 b). Druckauflage und verkaufte Auflage der BILD/B.Z. Deutschland vom 4. Quartal 2009 bis zum 1. Quartal 2019 (in Millionen) [Printed and paid circulation of the BILD/B.Z. from the fourth quarter of 2009 until the first quarter of 2019 (in millions)]. Retrieved May 29, 2019 from <https://de.statista.com/statistik/daten/studie/221651/umfrage/entwicklung-der-auflage-der-bild-zeitung/>
- Stehr, N., & Von Storch, H. (1995). The social construct of climate and climate change. *Climate research*, 5(2), 99-105.
- Süddeutsche Zeitung (2018). Klimaschutz; Sprit muss teurer werden [Climate protection; Gas must become more expensive]. Retrieved May 20, 2019 from <https://www.sueddeutsche.de/wirtschaft/benzinpreis-steuer-klimaschutz-1.4230359>

- Trumbo, C. (1996). Constructing climate change: claims and frames in US news coverage of an environmental issue. *Public Understanding of Science*, 5, 269-283.
- Van Voorhis, C. W., & Morgan, B. L. (2007). Understanding power and rules of thumb for determining sample sizes. *Tutorials in Quantitative Methods for Psychology*, 3(2), 43-50.
- Von Storch, H., & Krauss, W. (2005). Culture contributes to perceptions of climate change. *Nieman Reports*, 59(4).
- Von Storch, H., Meinke, I., & Claußen, M. (Eds.) (2017). *Hamburger Klimabericht–Wissen über Klima, Klimawandel und Auswirkungen in Hamburg und Norddeutschland [Hamburgs climate report knowledge of climate, climate change and consequences in Hamburg and Northern Germany]*. Berlin: Springer Spektrum.
- Weaver, D. A., Lively, E., & Bimber, B. (2009). Searching for a frame: News media tell the story of technological progress, risk, and regulation. *Science Communication*, 31(2), 139-166.
- Weingart, P., Engels, A., & Pansegrau, P. (2000). Risks of communication: discourses on climate change in science, politics, and the mass media. *Public Understanding of Science*, 9(3), 261-284
- Ytterstad, A. (2015). Framing global warming: Is that really the question? A realist, Gramscian critique of the framing paradigm in media and communication research. *Environmental Communication*, 9(1), 1-19.
- Zeitung.de (n.d. a). Süddeutsche Zeitung – Geschichte, Themen und Abo [Süddeutsche Zeitung – history, topics and subscription]. Retrieved March 20, 2019 from <https://www.zeitung.de/medien/sueddeutsche/>
- Zeitung.de (n.d. b). BILD-Zeitung – Geschichte & Abo [BILD newspaper – history & subscription]. Retrieved March 20, 2019 from <https://www.zeitung.de/medien/bild/>

Appendix A

Content analysis measure for frames

Attribution of responsibility frame

1. Does the story suggest that some level of government has the ability to alleviate the problem?
2. Does the story suggest that some level of government is responsible for the issue/problem?
3. Does the story suggest solution(s) to the problem/issue?
4. Does the story suggest that an individual (or group of people in society) is responsible for the issue/problem?
5. Does the story suggest that the problem requires urgent action?

Human interest frame

1. Does the story provide a human example or “human face” on the issue?
2. Does the story employ adjectives or personal vignettes that generate feelings of outrage, empathy, caring, sympathy, or compassion?
3. Does the story emphasize how individuals and groups are affected by the issue/problem?
4. Does the story go into the private or personal lives of the actors?

Conflict frame

1. Does the story reflect disagreement between parties/individuals/groups/countries?
2. Does one party/individual/group/country reproach another?
3. Does the story refer to winners and losers?

Issue frame

1. Does the story refer to two sides or to more than two sides of the problem or issue?

2. Does the story mention different policy options?
3. Does the story present public policy problems?
4. Does the story describe politicians' stands or statements on policy issues?

Morality frame

1. Does the story contain any moral message?
2. Does the story make reference to morality, God, and other religious tenets?
3. Does the story offer specific social prescriptions about how to behave?

(Economic) consequences frame

1. Is there a mention of (financial) losses or gains now or in the future?
2. Is there a mention of the costs/degree of expense involved?
3. Is there a reference to (economic) consequences of pursuing or not pursuing a course of action?

Progress frame

1. Does the story present technological change as a natural process?
2. Does the story present technological advances as beneficial for the society?
3. Does the story present technological and scientific progress as leading to social progress?
4. Does the story present technological change as linked to improving social conditions?
5. Does the story celebrate new developments?

Risk/Disaster frame

1. Does the story associate innovation with risks?
2. Does the story call for precaution for the consequences of technology or science?

3. Does the story call for action in face of possible catastrophe or out-of-control consequences due to technology or science?
4. Does the story portray the technological or scientific issue as fatal, where there is no way out?

Uncertainty frame

1. Does the story present the issue as scientifically weakly explained?
2. Does the story present the issue as related to dubious forecasts?
3. Does the story present the issue as not being based on confirmed knowledge?
4. Does the story present inconclusiveness in regard to the causes and consequences of the issue?

Appendix B

Example extracts

BILD:

Und während wir in Deutschland diesen Zielen kilometerweit hinterherhinken und ernsthaft wochenlang darüber debattierten, ob der Hambacher Forst für einen weiteren Braunkohle-Tagebau gerodet werden muss, sagt eine 15-Jährige das, was kein Politiker mehr hinkriegt: die Wahrheit. (Bild.de, 2018)

[And while Germany lags kilometres behind on these goals and seriously debates for weeks whether the Hambacher's forest must be stubbed for another brown coal open cut mining, a 15 year-old says, what no politician wangles anymore: the truth.]

Süddeutsche Zeitung:

Doch die große Koalition lässt das kalt. Sie hat sich offenbar fest vorgenommen, in der Energie- und Klimapolitik möglichst keine Spuren zu hinterlassen, von der Kohle vielleicht mal abgesehen. (Süddeutsche Zeitung, 2018)

[But it leaves the grand coalition cold. Apparently she plans preferably not to leave her marks in energy and climate policy, maybe disregarding the coal.]

Appendix C*Inter-coder reliability results*

Item	Cohen's Kappa value	Agreement in Percentage
1 st question responsibility frame	1,000	100%
2 nd question responsibility frame	-.091	83,3%
3 rd question responsibility frame	1,000	100%
4 th question responsibility frame	.800	91,7%
5 th question responsibility frame	.833	91,7%
1 st question human interest frame	.657	83,3%
2 nd question human interest frame	.571	83,4%
3 rd question human interest frame	.833	91,7%
4 th question human interest frame	.800	91,7%
1 st question conflict frame	.800	91,7%
2 nd question conflict frame	1.000	100%
3 rd question conflict frame	.824	91,6%
1 st question issue frame	.625	91,6%
2 nd question issue frame	.625	91,6%
3 rd question issue frame	.438	75%
4 th question issue frame	1.000	100%
1 st question morality frame	1.000	100%
2 nd question morality frame	1.000	100%
3 rd question morality frame	1.000	100%
1 st question consequence frame	.385	66,7%
2 nd question consequence frame	.824	91,6
3 rd question consequence frame	.667	83,3%
1 st question progress frame	1.000	100%
2 nd question progress frame	1.000	100%
3 rd question progress frame	1.000	100%
4 th question progress frame	1.000	100%
5 th question progress frame	1.000	100%
1 st question risk frame	1.000	100%
2 nd question risk frame	1.000	100%

3 rd question risk frame	-*	100%
4 th question risk frame	1.000	100%
1 st question uncertainty frame	1.000	100%
2 nd question uncertainty frame	-*	100%
3 rd question uncertainty frame	.625	91,6%
4 th question uncertainty frame	.625	91,6%

Note. *Cohen's Kappa cannot be calculated because one variable is a constant.