Portrayal of the nitrogen debate in Dutch newspapers

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Abstract

How sustainability challenges are relayed to the public is paramount to tackling such issues timely. However, there is still a lot to learn about the communication system between sustainability experts and the public. We looked at how Dutch newspapers portrayed the Dutch nitrogen debate that has been going on since 2019. 160 articles from four Dutch national daily newspapers were analyzed for their usage of frames and featuring of actors. The articles reflected no differences in usage of frames, however, actor portrayal varied significantly between newspapers: environmental experts appeared more often in *De Volkskrant*, there seemed to be a negative relationship between the number of portrayed farmers and construction workers, and popular newspaper *De Telegraaf* showed more signs of partisanship than the other newspapers.

Keywords nitrogen, science communication, industrial ecology, newspapers

1. Introduction

In May 2019 the Netherlands' highest governmental judiciary organ ruled that the Dutch program for nitrogen reduction (PAS) did not meet the EU standards that were necessary for nature conservation (Raad van State, 2019). Following the failure of the PAS, the Dutch government rejected a great number of nitrogen permits. Heated discussions followed on how best to decrease excess nitrogen.

Farmers were hit hard by the sudden change in legislature. Because nitrogen permits were being rejected, they could not expand their businesses as they had planned, and faced measures, like decreasing their livestock in order to meet deposition standards. The change in legislation also had an impact on other parts of the economy, in particular on the construction sector. Construction workers could not continue work as usual, as their activities were linked to nitrogen deposition as well. As a result, farmers and construction workers took to the streets and 2019 saw an increasing number of large protests, which raised a lot of media attention.

A notable protest took place at the Dutch environmental agency (RIVM) on the 16th of October. Protesters demanded clarification of the emission modelling done by the institute to predict nitrogen deposition. Protesters felt that the data by the RIVM was unreliable and should not be used to base the environmental legislature on. Because of this, a largely political issue, was turned into a scientific one. This mistrust shows why a stronger understanding of the current communicational system between the public and environmental scientists must be developed.

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A first step in analyzing the communicational system for this particular case would be to study how the nitrogen debate was framed in Dutch media, and what relevant actors were most prominently featured. This would give better insight into how these media act as the middleman between experts and laypeople in an environmental impasse.

2. Theoretical framework

Debates regarding sustainability have been intensifying since the second half of the last century, inspired by early reports of non-sustainability and classic studies on the environment (e.g., Silent Spring (Carson, 1962), and Limits to growth (Meadows et al., 1972)). One could argue that over the course of this debate two colliding worldviews have established themselves. One *idealistic strand* focused on change and preservation of nature and one *conformist strand* focused on maintaining the current status quo and economic continuity (Verstegen and Hanekamp, 2005). A divide that may be found in multiple other reviews on the politics of sustainable development as well (Jansson, 1994; Hamsvoort and Latacz-Lohmann, 1998).

This theoretical divide creates some useful footholds for debate analysis. The themes of the sustainability debate (i.e., environmental sustainability and economic prosperity) can be applied almost universally. This would mean that these opposing sides may also be identified within Dutch media articles that cover the nitrogen debate mentioned above.

Media like the internet, television, and newspapers are important information sources for the Dutch public (Commisariaat voor de Media, 2020). Input by these sources can shape the perception on the debate, as mass media are known to have an agenda setting influence (Anderson et al., 2005; Benton and Frazier, 1976). How environmental problems and their debate are presented online and on paper could therefore have a significant impact on public opinion and judgement.

Newspapers are regularly used to study how public debates are portrayed. For sustainability, some examples are: measuring media attention of sustainability (Schmidt et al., 2013), how the definition of sustainability changes in newspapers over time (Schwegler, 2015), or, what argumentation is used in favor or against sustainable change (Kleinen-von Königslöw et al., 2019). Our study will focus on two other aspects of newspaper coverage: frame usage and actor portrayal.

Framing

There are multiple ways to define frames. Within this article, we focus on *message framing* where the story behind a statement is pruned in such a way that it aims to elicit a certain way of thinking in its audience (de Bruijn, 2017). According to Wicks (2005), framing theory implies that the manner in which certain information is displayed will have different outcomes on different audiences. Wicks (2005) also states that these frames may be manipulated to influence public opinion.

We will build on the specific frames developed by Semetko and Valkenburg (2000). In their study, the authors focus on the portrayal of European politics in Dutch news, a set of five frames is presented that can be applied to a broad range of media, regardless of the specific topic: attribution of responsibility (1), human interest (2), conflict (3), morality (4), and economic consequences (5). Per frame the authors developed at least three questions that would resonate with the frame if answered with *True*. From their analysis, that covered 4123 news stories from both newspapers and television news, could be concluded that there are significant differences in the usage of these frames depending on the outlet.

More specifically, 'quality' newspapers would rely more often on the attribution of responsibility, conflict and economic consequences frames, while 'popular' news sources used the human interest frame more often.

Actors

Actors (i.e. persons or organizations relevant to the story) are mentioned in almost any newspaper article, usually as a way for the journalist to increase credibility in their piece, reference an event, or, to make a situation recognizable for the reader (Dimitrova and Strömbäck, 2009). Conversely, actors also play a role in giving shape to the news themselves. Not only in the way individual sources formulate ideas to journalists, but also by actively contacting journalists when actors want to share something newsworthy (Soley, 2008).

A general study into the way actors are featured in the media was done by Beckers and Van Aelst (2019). They studied all Belgian television news items between 2003 and 2016 (N=203,619) to check what actors were featured. The authors concluded that the use of actors differed significantly between sources. For example, politicians were mentioned more often on public broadcasting services, while commercial broadcasters featured more citizens. It could be that this same difference exists in quality versus popular newspapers, similar to what Semetko and Valkenburg (2000) had discovered.

A more environmentally focused actor-content analysis was done by Chetty et al. (2015). They looked into the framing of climate change news in New Zealand, while also looking for the different sources used by newspapers. In their study the authors provide a list of nine different actor categories such as politicians, academics and sceptics. The researchers found that a third of used sources consisted of politicians, and that 20% were scientists. A division that is interesting to explore in our case as well. We use this study as a basis for creating relevant categories of actors for the nitrogen debate.

Dutch newspapers and political landscape

In the Netherlands, there are a total of nine daily published newspapers (Commissariaat voor de media, 2020). These newspapers may be characterized in multiple ways. For example, in regard to their political inclination. But also, in terms of 'quality' versus 'popular' (Dirikx and Gelders, 2010; Lubbers et al., 1998). Quality papers often try to focus on the nuance of a story, while popular papers focus more on its entertainment value. This is similar to, but not the same as, defining newspapers as either a 'broadsheet' or a 'tabloid' (Hijmans et al., 2003). For many newspapers it is commonly known what type of paper they are. For example, *De Volkskrant* and the *NRC* are mostly described as quality newspapers, while *De Telegraaf* and *Het Algemeen Dagblad* are better known as popular ones (Hijmans et al., 2003).

There are two prevalent methods of selecting newspapers. Some researchers include the newspapers with the largest audience (Semetko and Valkenburg, 2000; Sözeri et al., 2019). Which is why The Netherlands' largest newspapers in terms of circulation (i.e., *De Volkskrant*, *Trouw*, *NRC*, *Het Algemeen Dagblad*, and *De Telegraaf*) are researched relatively often. Alternatively, other researchers opt to create a selection with the most diverse audience, to create a more complete image overall (Rietjens et al., 2013; Claassen et al., 2012).

We follow the second approach for this study. Therefore, articles from *DeVolkskrant*, *DeTelegraaf*, *Het Reformatorisch Dagblad* and *Het Financieele Dagblad* were used. Because *Het Reformatorisch Dagblad* is christian oriented, we imagined the newspaper would have a larger farmer base, as this is

often the case as well for political parties (e.g., the Christian party CDA is also known as the farmer's party). *Het Financieele Dagblad* has a more specific focus on financial news and may therefore portray the nitrogen issue in yet another way.

To create a better picture of the audiences of these newspapers we could turn to each of their profile pages. On these pages the newspapers describe their readers to potential advertisers:

De Volkskrant is according to their profile page geared towards people that want to know how the world functions and want to be objectively informed about it. The newspaper describes itself as the biggest quality news brand in the Netherlands (DPG Media, 2021).

De Telegraaf state in their profile that they give shape to conversations and dare to have a strong opinion. Their public is therefore people that want to stand for something and have strong opinions themselves (Mediahuis, 2021).

Het Reformatorisch Dagblad defines itself as a quality newspaper for the Christian minded. The newspaper gives attention to how Christians exist in today's society and how societal developments influence them (erdee media groep, 2021).

Het Financieele Dagblad highly appreciates trustworthy facts and deep insights, according to their profile. The newspaper defines itself as a quality newspaper that gives financial meaning to the current news (FD Mediagroep, 2021).

As the issue seems to be highly political, it will be interesting to see how political parties and politicians were represented in newspapers. In earlier studies newspapers have already shown to have partisan tendencies (Larcinese et al., 2011), though such analyses cannot be found for Dutch newspapers. Conversely, a Swiss study actually found that the number of politicians mentioned in four of their quality newspapers was not generally affected by the party the politicians stemmed from (Tresch, 2009). Instead, whether the politician spoke up during debate or was a prominent within the party was a better determinant of their prominence. To connect this to the Dutch issue we study, it is important to get an understanding of the political system during the crisis.

During the time period we focused on, there was a coalition of four ruling parties in the Dutch government: (1) The liberal, right-wing VVD, which had the most seats in government. (2) The liberal, more centered D66, which focused on tackling environmental problems. (3) The CDA, a Christian, conservative party with a large farmer constituency. And (4) the CU, which is similar to the CDA, but is a bit more progressive. The key players in this debate were the VVD prime minister, Mark Rutte, and the CU minister of agriculture, Carola Schouten.

Goal of this research

Previous research suggests that there are variations in how different newspapers portray certain issues in terms of framing and featured actors. This would mean that different audiences could form vastly different opinions on environmental issues, based on their source of news. However, no analysis has been performed on how the Dutch nitrogen debate was portrayed in newspapers, which is what this study aims to do. This leads to the following research question: *How do various newspapers portray the Dutch nitrogen debate?* and the following sub questions:

- How do different newspapers frame the nitrogen debate?
- Which actors are named in their articles?

- How are politicians and their parties featured specifically?

This study tries to create a better understanding of how different newspapers affect the transmission of information regarding environmentally sensitive topics. This will help to improve the debate on the nitrogen crisis, or other environmental crises in the future in which mass media play an important role.

3. Methods

In the following section we will go over the methodology of this study. First, we elaborate upon the selection process, next we explain the set-up of our content analysis and we end by giving details on our statistical analysis.

Selection process

The selection process is split up in three parts. Data selection, screening the selected data, and creating a final data set.
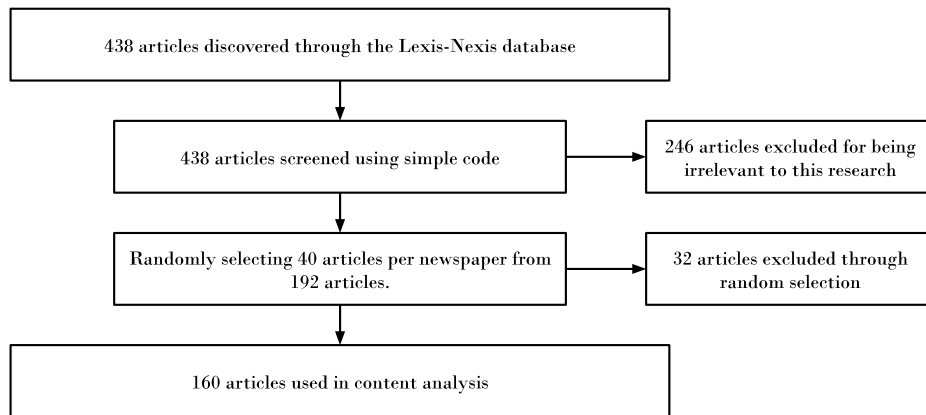
Data selection

In this phase all the possibly eligible articles were gathered. We used the database of Nexis Uni (LexisNexis, 2021) to obtain relevant newspaper articles. As mentioned in the theoretical framework, we included four newspapers: *De Volkskrant*, *De Telegraaf*, *Het Reformatorisch Dagblad*, and *Het Financieele Dagblad*. The keyword *stikstof* (nitrogen) was used to filter out non-relevant articles. We included articles published between September 1st and December 31st, 2019, since the nitrogen debate was covered most frequently in those months. Finally, we chose to only include articles with 300 to 1000 words. This way, any significant differences in number of identified frames and actors would be caused by the actual content of the article, not by the length.

Screening

The focus of this research is the nitrogen debate. However, 'nitrogen' is a broad term and since it was the only keyword used in the search, many non-relevant articles had made it into the selection. A simple code to screen the articles in a replicable and reliable manner was created. All 438 articles were screened, after which 10% was compared to the results of a second independent coder. This resulted in a high intercoder reliability (κ = .913 (Cohen, 1960)), meaning this selection could be used reliably.

Inclusion of articles

At this stage the data set contained 192 articles, with different numbers of articles per newspaper. The smallest number per newspaper was 40 articles (*Het Financieele Dagblad*). To be able to directly compare the data sets to each other we made a final, random selection of 40 articles per newspaper. The final selection therefore contained 160 articles in total. A diagram of the selection process is shown in Figure 1.

Figure 1. Diagram of the newspaper article selection process in which the numbers of included and excluded articles are shown. What articles are excluded for what reason may be found in the appendix.

Content Analysis

Our code book consisted of two parts: the framing analysis, in which the appearance of certain frames in articles is investigated, and, the actor analysis, in which the portrayal of different actors is discussed.

As mentioned in the theoretical framework, the frames that were analyzed within this study are based on the work by Semetko and Valkenburg (2000). They proposed *True* or *False* questions such as "Does the story suggest solutions to the problem?" to indicate the presence of one of five frames (See also table 1). Two of the questions the authors used in their research were not applied in our case: one for being shown to be unreliable in their own paper and the other for being inapplicable in our case as it concerned attached images, which we did not have for our articles.

The questions, or frame indicators, supplied with each frame were tested for robustness. To do this, two coders performed a pilot analysis on 15 articles outside of the selection of the main research data. The pilot analysis showed that inter-coder reliability was not sufficient for many of the framing questions. This was mainly caused by confusion about the actual meaning of some questions that could be interpreted in multiple ways. To remedy this, some additional rules and examples were provided for the full analysis

Furthermore, some questions were answered differently based on the implicit meaning of the entire article. To improve reliability in that regard, coders were asked to provide a single sentence as proof for answering a question with *True*. This would eliminate answers based on the feeling of the overall article. As an added benefit, this also generated data for a more qualitative investigation of what caused the specific frames to occur in general.

To ensure the reliability of the data that was gathered in the content analysis, 10% of the articles were also coded by an independent coder. These results were afterwards compared using Cohen's Kappa (Cohen, 1960). For the framing analysis the inter-coder reliability rating initially ranged from κ = .2 to κ = 1.0 for the different questions. We decided to leave out two questions that were not reliable

enough. After this, the lowest Kappa was $\kappa = .46$, which is regarded as moderate agreement (Landis and Koch, 1977; Warrens, 2015). Measured over the entire codebook the average inter-coder reliability was $\kappa = .71$ and average percentage agreement was 88.3%, which is acceptable for an explorative study like this one. The final selection of framing indicators that were used in this research may be found in table 1.

Next to the framing analysis, an actor analysis was performed on the content of the selected articles as well. We only included individual actors that were mentioned by their name and categorized those. Similar to a study done by Masini and Van Aelst (2017) up to 15 actors per article were noted down, together with their appropriate category.

In total nine categories were defined and refined during the pilot phase: environmental experts, other researchers, farmers, construction workers, industry experts, politicians, other governmental actors, commentators, and, other. Each with their own examples to inform the coders what the categories entailed exactly.

Table 1. Frames and associated indicators, adjusted from Semetko and Valkenburg (2000). These questions do not include the two that were not used because of a low intercoder reliability score, and the two questions that were already excluded in our set-up.

1. Attribution of Responsibility
a. Does the story suggest that some level of government has the ability to alleviate the problem?
b. Does the story suggest solution(s) to the problem/issue?
c. Does the story suggest that an individual (or group of people in society) is responsible for theissue/problem?
2. Human Interest
a. Does the story provide a human example or "human face" on the issue?
b. Does the story emphasize how individuals and groups are affected by the issue/problem?
c. Does the story go into the private or personal lives of the actors?
3. Conflict
a. Does the story reflect disagreement between parties, individuals, groups, or countries?
b. Does one party-individual-group-country reproach another
c. Does the story refer to two sider or to more than two sides of the problem or issue?
4. Morality
a. Does the story contain any moral message?
b. Does the story make reference to morality, God, and other religious tenets?
c. Does the story offer specific social prescriptions on how to behave?
5. Economic Consequences
a. Is there a mention of financial losses or gains now or in the future?
b. Is there a mention of the costs/degree of expense involved?
c. Is there a reference to the economic consequences of pursuing or not pursuing a course of action?

Same as for the framing analysis, 10% of the actor analysis was coded by two independent coders to check the reliability of the data. Cohen's Kappa (Cohen, 1960) was used here as well to calculate the inter-coder reliability. For the actor analysis this reliability measured Kappa = .83, which is defined as almost perfect agreement (Landis and Koch, 1977; Warrens, 2015).

Statistical analysis

The statistical analysis of this research was done using a Chi-square test of independence (Pearson, 1900), in which observed data is tested against expected data to see whether a significant difference exists. In this case, expected data for a single category was derived from the overall mean of the whole sample. The test expects frequency or count data and can therefore be used for both the framing and actor analyses.

During the Chi-square test of independence, the standardized residuals for each category were also calculated and their p-values determined using a Z-test. This way the manner in which specific categories (i.e., actor categories or frames) deviated from their expected values could be analyzed as well.

During the analysis we split up the politicians into their respective parties as well, as they represented a large portion of our data set and we wanted to explore this subgroup more in dept. We did this by looking up the politician's party using their name, which was noted during data collection.

To better compare the prominence of political parties between newspapers, Simpson's diversity index was calculated for each of the newspapers (Simpson, 1949). This statistic supplies us with the probability that two actors from the same political party are found if they are sampled at random from the article pool.

4. Results

We analyzed 160 newspaper articles regarding the nitrogen issue and identified 725 framing indicators and 482 mentions of actors. Articles from *De Volkskrant* had an average word-count of 642.8. For *De Telegraaf* this average was 566.2. For *Het Reformatorisch Dagblad* it was 529.1. And, for *Het Financieele Dagblad*, it was 604.5.

Framing analysis

The totals of identified framing indicators per newspaper and frame can be found in Table 2. No articles showed no framing indicators at all, though five articles showed only one. The maximum number of framing indicators identified in a single article was nine, of which there also were five cases. On average, 4.5 framing indicators were identified per article.

The frame that was indicated the most was *Attribution of responsibility*. This was mostly due to newspapers focusing on the responsibility of the government in causing and attempting to solve the problem at hand. The focus on the responsibility that farmers and construction workers had as polluters was less present in that regard. The *Conflict* frame was used second most. This was largely due to the large number of articles covering either the protests or heated political debates about the issue. Thirdly, the *Human interest* frame was mostly comprised of articles painting farmers and construction workers as victims of the crisis. The morality and economic consequences frames were indicated the least.

Table 2. Total number of identified framing indicators per frame, per newspaper. In brackets the percentage of articles showing at least one indicator of that frame within the sample. There are no significant differences in the standardized residuals (*). De Volkskrant = VK; De Telegraaf = TG; Het Reformatorisch Dagblad = RD; Het Financieele Dagblad = FD

Frame	VK	TG	RD	FD	n
Attribution of responsibility	79 (93%)	63 (88%)	73 (95%)	83 (98%)	298
Human interest	25 (45%)	33 (60%)	32 (55%)	19 (40%)	109
Conflict	57 (75%)	45 (63%)	46 (73%)	53 (68%)	201
Morality	15 (28%)	11 (23%)	15 (30%)	9 (15%)	50
Economic consequences	24 (48%)	12 (28%)	13 (28%)	18 (33%)	67
Totals	200	164	179	182	725

The Chi-square test of independence showed that there was some significant difference present for the usage of frames between newspapers $\chi^2(6, N = 725) = 13.8, p = .032$. Showing there is some relation between the number of framing indicators and the newspaper. However, the standardized residuals showed no specific frame that was the cause for this difference.

Actor analysis

From the 482 actors mentioned (see Table 3), the vast majority were politicians (n=301). In contrast, other governmental actors were mentioned only five times in total. *Het Financieele Dagblad* mentioned the most actors (n = 127), while *De Volkskrant* mentioned the least (n = 102). Same as for the framing analysis, a Chi-square test was used to test whether there were significant differences in how often newspaper mentioned certain actors. The results of this test are shown in Table 3. It must be noted that, because some of the categories yielded low numbers (e.g., "Other governmental actors") they could not be reliably analyzed using a Chi-square test as their expected values were lower than five (Moore and Kirkland, 2007). These categories were therefore excluded from the analysis.

The overall number of actors mentioned between newspapers differed significantly $\chi^2(15, N = 446) = 67.6, p < .001$, meaning that the newspapers had an overall different selection of mentioned actors. *De Volkskrant* showed significantly more environmental experts ($p < .001$). *Het Reformatorisch Dagblad* showed significantly less construction workers ($p < .05$), but significantly more commentators ($p < .001$). *Het Financieele Dagblad* showed significantly more construction workers ($p < .01$). Conversely, *De Telegraaf* did not show any significant differences in actor mentioning whatsoever.

In Table 3 the percentage of articles featuring a certain actor category is also shown. Some of the differences between newspapers became more pronounced. For example, 30% of articles from *De Volkskrant* featured at least one environmental expert, while for *Het Financieele Dagblad*, that number is only 10%.

Table 3. Total number of actor mentions per newspaper. In brackets the percentage of articles featuring at least one actor from that category within the sample. Significant differences in the standardized residuals are denoted with an asterisk (*). Actor categories that were excluded because of their low numbers are denoted with [a]. De Volkskrant = VK; De Telegraaf = TG; Het Reformatorisch Dagblad = RD; Het Financieele Dagblad = FD
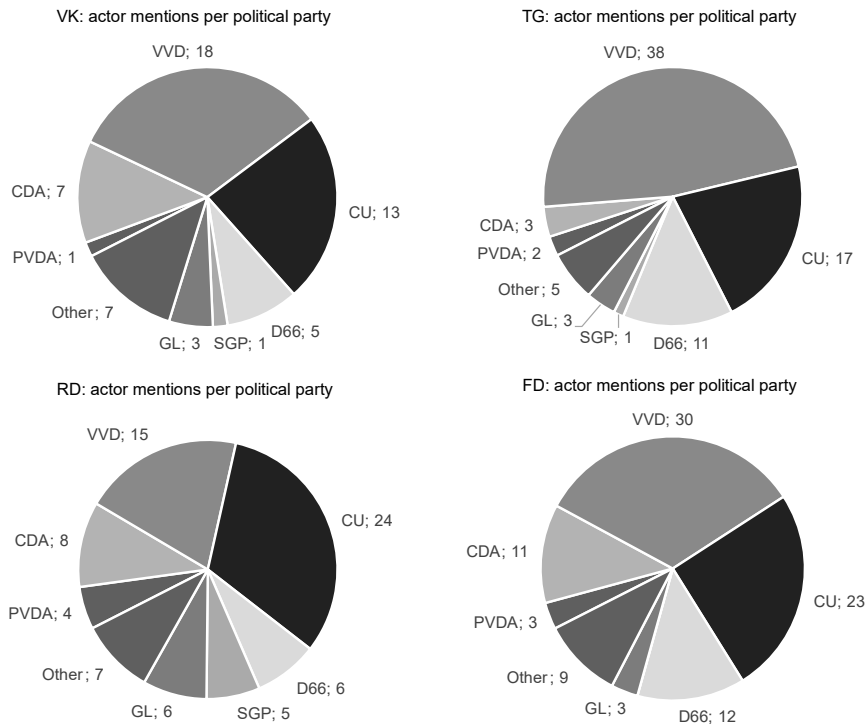
Category	VK	TG	RD	FD	n
Environmental experts	17* (30%)	6 (13%)	7 (18%)	5 (10%)	35
Other researchers	6 (10%)	0 (0%)	3 (5%)	4 (8%)	13
Farmers	11 (15%)	9 (10%)	14 (28%)	4 (10%)	38
Construction workers	3 (5%)	9 (15%)	2* (5%)	16* (20%)	30
Industry experts	2 (5%)	10 (15%)	7 (13%)	4 (10%)	23
Politicians	55 (60%)	80 (80%)	75 (70%)	91 (75%)	301
Other governmental actors	2 (5%)	2 (5%)	0 (0%)	1 (3%)	5
Commentators	2 (5%)	2 (5%)	14* (8%)	1 (3%)	19
Other	8 (10%)	5 (8%)	4 (5%)	1 (3%)	18
Totals	106	123	126	127	482

To show the relationship between how the different actor groups are featured with each other, a Venn-diagram can be used. To reduce the complexity of the diagram, only the four most prominent actor groups are displayed in Figure 2. The diagram shows that 71 articles mention only politicians, both environmental experts and construction workers are mentioned alone seven times, and farmers have five articles to their own. Farmers, environmental experts, or, construction workers, are actually not mentioned most by themselves, but are most often mentioned together with just politicians (n=12, n=15, n=9, respectively). Remarkably, environmental experts are not mentioned once in the same article as construction workers. Farmers as well, are only mentioned twice in connection to construction workers.
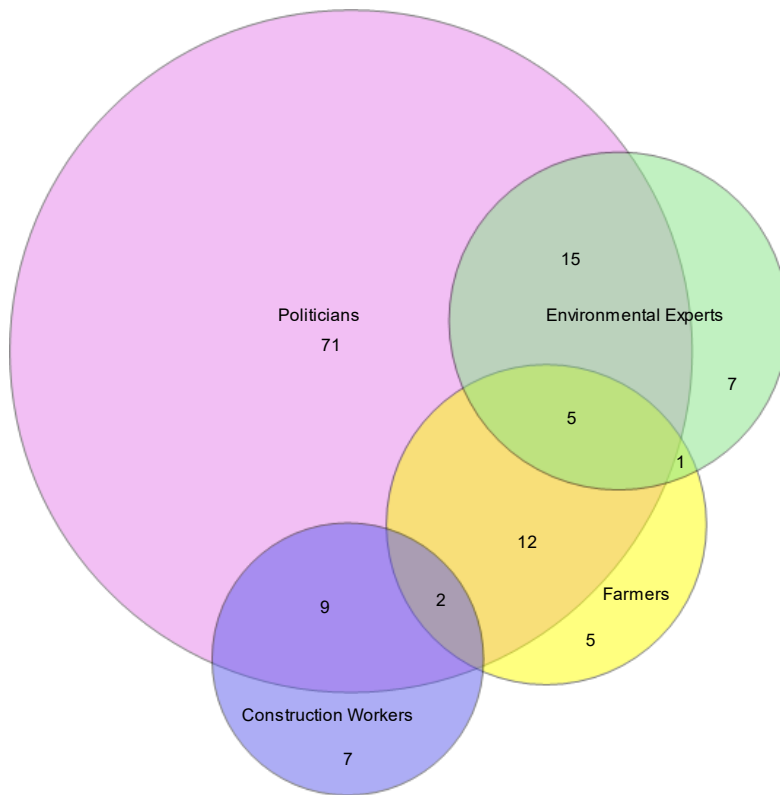
Figure 2. Proportional venn-diagram showing the division of actor categories amongst newspaper articles. The diagram shows what number of articles within the sample feature what combinations of actors. The four largest actor categories (in number of mentions) are each represented with different colours. The number in each circle represents the article count (Also reflected in the size of the circle). For example, within the sample only one article featured both Farmers and Environmental Experts. Created using the deepVenn program Hulsen et al. (2008).

Finally, the politicians were split up per their respective parties, the distributions of which can be seen in Figure 3. The VVD (A right wing liberal party that at the time was part of the ruling coalition) is three out of four times the most mentioned party. Only Het *Reformatorisch Dagblad* mentions the ChristenUnie (CU, a Christian centrist party) more often. As mentioned in the methodology, Simpson's diversity index was calculated for each of the newspapers (Simpson, 1949). For *De Volkskrant* this index is .18, for *De Telegraaf* it is .29, for *Het Reformatorisch Dagblad* it is .17 and for *Het Financieele Dagblad* it is .20. These numbers represent the probability that two actors from the same political party are found if they are sampled at random from that paper's article pool.

VK: actor mentions per political party

TG: actor mentions per political party

RD: actor mentions per political party

FD: actor mentions per political party

Figure 3. Per newspaper circle diagram of politician mentions, divided up per political party. Parties that for none of the newspapers showed more than 3 mentions were grouped under "Other" for the sake of clarity. De Volkskrant = VK; De Telegraaf = TG; Het Reformatorisch Dagblad = RD; Het Financieele Dagblad = FD.

5. Discussion

Lack of difference in frames

As mentioned in the theoretical framework, we had expected to find a difference in the usage of frames between newspapers. For example, in earlier research, qualitative newspapers like *De Volkskrant* were more inclined to use the 'Attribution of responsibility' frame than popular newspapers like *De Telegraaf* (Semetko and Valkenburg, 2000). And *De Telegraaf* used 'Human interest' frames more often. However, contrary to what we expected, no such difference presented itself within our dataset.

It could very well be possible that the nitrogen issue and debate were too specific for these differences to emerge. As was shown in the methodology, during this research a precise selection was made, of which the publication dates ranged only over four months. This resulted in articles covering many of the same topics and events, be it protests or debates. For that reason, it could be that editors abandon (to a certain level) the standards of their newspapers and write up stories that are mostly led by the events themselves. It makes sense that the conflict frame is used when describing a protest. Or, that the attribution of responsibility frame is often used by all newspapers, because responsibility plays

a central role in the issue as a whole. The research by Semetko and Valkenburg (2000), though it focused on the framing of European politics, covered a whole range of issues overall. This leaves more to the interpretation for each newspaper and could explain the differences they have shown.

Usage of actors

From the results it became clear that there are significantly more mentions of environmental experts in *De Volkskrant* than in the other newspapers. This could have to do with the fact that *De Volkskrant* wants to abide by their image of a quality newspaper and will therefore use more scientific sources to support their stories. However, both *Het Reformatorisch Dagblad* and *Het Financieele Dagblad* identify themselves as quality newspapers as well (erdee media groep, 2021; FD Mediagroep, 2021). Which means that only the label of a quality newspaper is not enough to explain this difference.

A possible explanation was found in the editorial code of *De Volkskrant* (De Volkskrant, 2018). In these guidelines to authors the so-called Van Calmthout Protocol is specified that states that: "With any news article on research, be it scientific or not, we must call at least one independent expert that we can ask for assessment. Not only must we call them, we must also publish at least one paragraph on that third-party commentary" (De Volkskrant, 2018). As such guidelines could not be found for either *Het Reformatorisch Dagblad* or *Het Financieele Dagblad*, it could very well be possible that the difference in expert portrayal exists because of this specific protocol.

There were some significant differences in the division of construction workers as well. *Het Financieele Dagblad* showed more construction workers or their spokespersons. This could have to do with the fact that *Het Financieele Dagblad* is more geared towards entrepreneurs and businessmen. That target audience may be able to identify better with the business perspective of bigger contractors and the impact the crisis had, also financially, on large cooperative projects with many businesses involved. *Het Reformatorisch Dagblad* mentioned, in contrast to *Het Financieele Dagblad*, significantly less construction workers. Only two times in comparison to the 16 mentions by the latter. When looking at the data, you could argue that there was some kind of tradeoff going on in which mentioning more construction workers resulted in mentioning less farmers and vice versa.

A possible explanation for this inverted relationship is the fact that newspapers only have so much space to fill and must therefore decide between different stories, or aspects of stories (Jang and Pasek, 2015). Farmers and construction workers represent different sides of the debate, farmers being often seen as the cause of the nitrogen issue overall and construction workers as victims of the legislature. This divide can also be seen in Figure 2, that shows that construction workers and farmers are only mentioned in the same article twice. Newspaper editors, having only limited space to fill therefore have to choose between either of the two to be able to form a coherent story.

Two-sided debate

We have already introduced the division in the sustainability debate between "idealists" and "conformists" (Verstegen and Hanekamp, 2005). We asked whether this divide could also be applied to the more local nitrogen debate. Through the content analysis it became clear that this division was clearly present in the political debate. Statements like the one done by D66 politician Tjeerd de Groot urging to half the current Dutch livestock (De Telegraaf, 2019) are examples of idealistic thinking. While,

for example, the VVD and the CDA focused more on technological remedies that would help preserve the status-quo (Hotse Smit, 2019).

Did this divide also present itself between the different newspapers? For the conformist view you would expect the economic consequences frame to appear more, while for the idealist view the attribution of responsibility frame is more likely to manifest itself. Within that line of thinking, the newspapers gave a decently balanced view of the debate, since we found no significant difference in usage of frames.

However, this balance between newspapers was less clear in the actor analysis. As discussed above, significant differences in the mentioning of actors were present (Table 3). However, more interesting in this regard are the differences in mentioned political parties (Figure 3). We have already concluded that the idealist/conformist division can be seen in the political debate, which then could extent to politicians mentioned in the newspapers.

In the theoretical framework we mentioned a study which showed that for quality newspapers the party of a politician was not a great determinant for the politicians' prominence in said newspapers (Tresch, 2009). Coincidentally the three quality newspapers within this research (i.e., *De Volkskrant*, *Het Reformatorisch Dagblad*, and *Het Financieele Dagblad*) all show similar diversity indexes in their use of politicians (i.e., .18, .17 and .20 respectively). It is *De Telegraaf* that shows the biggest divergence with a score of .29. It might be interesting for future studies to check if politically biased news is more present in popular newspapers.

In practice

The results show that there was no newspaper that used a specific frame significantly more than the other newspapers. Though the framing of articles does not necessarily give an indication of how trustworthy the information is that is presented, it is good to see that on this specific issue, readers of different newspapers were informed in a similar manner. On a similar note, the difference in distribution of featured actors was also not very profound. When taking all the newspapers into account there is a fairly equal division in environmental experts, farmers, construction workers and industry experts. Politicians may be overly present. However, this was already shown in earlier research (Chetty et al., 2015) and is probably inevitable in a highly legislative issue such as this one. The fact that politicians are featured more may also be regarded as positive, as they represent a broad range of views by themselves.

That being said, there are still some improvements that can be made. For example, if we look at the division of actors between newspapers, some notable differences appear. Though most of these differences can be attributed to newspapers appealing to their specific audiences, the division in environmental experts requires attention. Environmental experts were mostly represented within *De Volkskrant*, while other newspapers lagged behind. Environmental experts could in the future choose a more prominent position in the debate in order to be represented more equally by all newspapers. Regardless of the editorial code of these newspapers.

Researchers should in future debates not be reserved in speaking to the press about environmental issues. On top of this, experts should proactively find out and report to newspapers that are partial to featuring less environmental experts, such as *De Telegraaf*, *Het Reformatorische Dagblad* and *Het Financieele Dagblad*.

Limitations

As described in the methods section, this research only selected articles between 300 and 1000 words, as this would make the articles between newspapers more comparable. It could however be, that by leaving out the more in-depth articles, the articles in which newspapers are able to appeal more to their respective audiences were negated. Leaving us with the more generally focused articles that may adhere less to the newspapers' own identity.

Similarly, it could also be the case that when editors only have little space, they are more likely to only use a single frame or actor in their article. This would mean that such differences are more likely to occur in articles with less than 300 words, as editors are forced to choose in line with their newspaper's identity. Though experience tells us that these articles are mostly very factual news items.

For the framing analysis, it must also be noted that the sample size of this research was a lot smaller than the one performed by Semetko and Valkenburg (2000). Where we have analyzed a total sample of 160 articles, in their research the authors have analyzed 4,123 stories, of which 2,601 newspaper articles. On top of this, their sample was also spread out over a large section of time: their data covered six years of news, ours covered 4 months. It could very well be that the differences in framing shown in our sample, though they are too small to be called significant right now, could become more spread out if this research was performed again with a much larger sample size.

Then, as stated in the methods, we only categorized actors if they were mentioned by name. However, during coding it became evident that for some categories, actors were more often mentioned as a group than by individual names. Especially farmers were often mentioned as a representative of their group, instead of being named. This raises questions to what extent the reader is influenced by this depersonification.

Finally, at the beginning of this research the decision was made to focus on printed media in the format of newspapers as they are easily accessible and benefit from a larger scientific framework to base the research around. However, newspapers have over the past decades become an increasingly less important medium through which the public get their information and form their opinion. To get a more complete overview of the communicational landscape, online media should be included in further research.

Future research

An important part content analyses is not only the analysis itself, but also validating the research in society (Krippendorff, 2018). Though multiple interesting conclusions can be made on the basis of the article content of newspapers, it is crucial to check whether the impact of these differences is also existent in the public that reads them. This is something that would be interesting to study in the context of this analysis as well. For example, though we can assume based on literature that being exposed to more environmental experts in *De Volkskrant* may have an impact on reader's opinions, it will be interesting to measure what that difference exactly is in this case.

It will also be interesting to compare the results of this study to future national debates. Not only is the nitrogen crisis still going on as we speak. The Covid-19 pandemic sparked uproar as well, again targeting the RIVM in some cases. How do these cases connect to the conclusions from this research, and what specific lessons can be learned from them?

6. Conclusion

We analyzed 160 articles from four different Dutch newspapers on the nitrogen debate for their usage of frames and actors. We found 725 framing indicators, which were mostly attributed to the *Attribution of Responsibility* and *Conflict* frames. Something that was in line with the premise of the nitrogen debate. An overall difference in framing between newspapers was found to be significant. However, it was only barely so and could not be attributed to a specific frame, as no significant difference in usage was present for any of the frames or framing indicators between newspapers.

The usage of actors was more diverse in comparison. Overall, 482 actor mentions have been identified. Significantly more environmental experts could be found in *De Volkskrant*, which is in line with their reputation and editorial code. Furthermore, there seems to be a choice for the use of either farmers or construction workers in a piece but rarely both. This seems to be testament to the fact that only limited space is available in any newspaper issue, causing editors to choose who will be featured. Finally, the newspapers do seem to show some level of partisanship, something that seems to be especially true for *De Telegraaf*, which is the only popular newspaper that was analyzed.

A next step would be to connect this to new media as well to create an even clearer picture of the communicational landscape between experts and laypeople in crises such as this one.

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