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Risk in discourses around fracking: a discourse linguistic perspective on the UK, the USA and Germany

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ABSTRACT

Hydraulic fracturing or “fracking” is a relatively new method of energy extraction that makes it possible to use considerable amounts of shale gas that were hitherto unreachable. Although proponents of fracking voice their hopes for energy independence and an economic boost, fracking has been under discussion in several countries, its possible risks playing a key role when it comes to political decisions regarding the technology. This paper shall examine media discourses surrounding the usage of fracking with a specific regard to the risks that are constituted. Discourses in the UK, the US and Germany are compared, focusing on similarities and differences. These three countries are chosen since the political approach on fracking has been quite different, with the US being one of the first countries to use fracking. The corpora are analyzed with a focus on the depiction of conflictive issues in the framework of so-called *agonality*. The public perception of risks is shaped by their dominance in the media and the way they are phrased (e.g. as something to worry about), which means that differences in the depiction of risks between the corpora of these three countries are particularly noteworthy. Most readers will not be experts on fracking and thus rely on linguistic descriptions of the technology and its possible potentials and risks. Thus, it is important to analyze how language constitutes fracking. While all three corpora focus on risks concerning drinking water, there are major differences, e.g. when it comes to the discursive weight of earthquakes that might be caused by fracking. Although this is a risk that could affect all countries, only the UK press describes this as a serious risk. The paper also focuses on risks that are harder to grasp, e.g. threats to the traditional social structure of communities where fracking is practiced.

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1. Fracking, discourse and risk – an introduction

Hydraulic fracturing, or “fracking”, is a highly controversial technology. The horizontal drilling technique can be used to extract shale gas from reservoirs which had been hard to reach before. While the technology is widely used in the USA (e.g. in states like Pennsylvania and Colorado) and has been praised for its potential, other countries such as Germany and the UK have been hesitant to use it. From a scientific perspective, several risks have been discussed, including

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health risks for humans and animals (Paulson and Tinney 2015, Law 2015, Bamberger and Oswald 2015) and specifically concerns about water safety (Paulson and Tinney 2015, 11ff.). Jaspal, Turner, and Nerlich (2014), Jaspal and Nerlich (2014) as well as Mercado, Álvarez, and Herranz (2014) have shown public opinion on fracking in the UK and Spain to be rather negative. This should be analyzed further, especially regarding risk, since this is likely to mean that risks may be emphasized in the media and thus create negative viewpoints on the technology. Using a risk conflict framework, Maesele (2015) points out the importance of public debate and newspapers (and their stance towards risks) in democratic societies.

In this paper, I shall use the framework of *agonality* as a discourse linguistic approach to analyze risk depiction in fracking media discourses in the US, the UK, and Germany. The term *agonality* denotes a general concept of conflict within democratic discourses and the competition between different opinions and stances. These positions are put in contrast to each other using language and are thus made visible and observable for linguistic research. The analysis of these positions may also be helpful for further risk communication with regard to fracking: it shows which risks are deemed worthy of discussion, which countries' newspapers depict which risks and thus how the public might perceive the rather abstract risk of a technology, since this will probably only be perceived via the media by many. By opposing the positions, the *agonality* approach shows the spectrum of possible positions when it comes to risk depiction (and expectations of potential); this may also be of importance when it comes to risk governance and justifying political decisions in democratic societies.

Section 2 discusses the *agonality* approach and its relation to risk and discourse analysis. Section 3 presents the multilingual corpus, which is the basis of the analysis, while section 4 presents the research results and focuses on the conflicts concerning risks, pointing out similarities and differences between the German, UK, and US discourses. This is of particular interest because even though the technology itself is the same in all three countries (and should thus pose the very same risks for each of them), the emphasis which is placed on the different risks differs significantly between the corpora (see also Grundmann and Scott (2014) on the relevance of the country in which a newspaper is published regarding the depiction of climate change). The analysis will also take the aspect of chances as a "counterpart" to risks into account, since the competing positions also refer to potentials of the technology and weigh these against risks (see Zinn [2015] on motivations of risk-taking).

This paper builds on results from the author's PhD thesis (Mattfeldt 2018a) and applies them to risk research. The thesis focused on *agonality* in UK, US, and German media discourse. The relationship between humankind and nature as it is depicted in newspaper and online articles on Hurricane Sandy and fracking was analyzed developing and using the *agonality* framework. The thesis focused on cultural and linguistic similarities and differences.

2. Theoretical framework and methodology

Risk and risk behaviour have been analyzed from different perspectives. Definitions of risk include ontological viewpoints which see risk as a "situation or event where something of human value (including humans themselves) is at stake and where the outcome is uncertain" (Rosa 2010, 240) or rather epistemological definitions (see e.g. Lupton 1999). Renn (1992) gives a comprehensive overview of several risk definitions in different fields, e.g. technological, psychological, sociological, and cultural approaches.

This study is not an attempt to add a new definition of risk to the vast amount of theories and debates but rather shows a linguistic viewpoint on risk constitution in discourse. It approaches risk from a linguistic and, more concretely, a semantic perspective and looks at the concept of risk (and thus at the semantics that play a role). Risk in the sense of an undesired consequence of something may be voiced using different words or patterns on a linguistic

surface-level, e.g. conflict or emotion vocabulary (see also Müller and Stegmeier [2019, 312], who analyze the concept of risk quantitatively and also take into account “all English words whose semantic descriptions share some reference to the possibility of an unwelcome outcome”). Different aspects which are discussed in the approaches explained by Renn (1992) may come into play here. This means that – for the purposes of this paper at least – risk will be regarded as something with the semantics of an undesired consequence – whether this has more to do with uncertainty or the value at stake is only of importance on a second level. Thus, the risk concept used here can be understood as a semantic approach and a deliberately broad one at that: the “unwelcome outcome”, as Müller and Stegmeier phrase it in the quote above, is constituted in very different linguistic ways (and refers to very different ways in which this outcome could be undesirable) when we talk and write about this possible future. Some of these linguistic ways can be described and analyzed using the agonality approach suggested in this paper, as I will demonstrate below. Zinn (2010) describes how a combination of sociological viewpoints with a corpus linguistic analysis of media coverage can help gain further insights into risk communication. This paper builds on this by analyzing how language constitutes the concept of risk using expressions with the semantics of undesired consequences in newspaper articles, specifically when it comes to conflicts. This means that what is analyzed here is how risks in the context of fracking may be constituted in the media (and thus in lay language rather than expert usage of the expression “risk”, which means that lots of words with similar semantics may indeed become part of the analysis). The media play an important role in our perception of risks and their severity and of what constitutes an actual risk in our mind, which may influence an individual’s behaviour (cf. Tulloch 2016). Zinn and McDonald (2018, 26) point out that many risks cannot be perceived directly; our awareness of them depends entirely on risk communication, particularly in the media. This means that the linguistic constitution of a risk as established by the media needs to be examined. A number of linguistic analyses have taken the word “risk” or related expressions as a starting point (e.g. Müller and Vogel [2014] in a comparative approach to German, Italian and English corpora; also Zinn and McDonald [2018]). The method and framework for the analysis of risk constitution suggested here is that of agonality in discourse, which includes a wide array of linguistic means in order to see in which other ways risk as a concept with the semantics of undesired consequences may be constituted. Following the tradition of discourse studies by Niehr (2014), Reisigl (2015), and (with regard to risk) Müller and Vogel (2014) as well as Felder and Jacob (2014), discourse is regarded as both an analytical term that denotes a collection of data on a particular thematic issue and as a force pervading life in society beyond linguistic means and shaping the way we see the world.

To understand the method used for the analysis of risk in this particular discourse, it is crucial to first focus on the aforementioned central term of *agonality*. Agonality is a discourse linguistic term derived from the Greek word *agon* (an ancient sporting competition, see Gutsfeld and Lehmann 2013). It denotes a competition between different discourse actors, their positions, and the concepts they explicitly or implicitly depict as dominant and crucial for decisions (see Felder 2015; Mattfeldt 2018a, 2018b). This competition may refer to a number of issues, depending on the discourse that is analyzed. However, in many cases, risk comes into play and is constituted linguistically, e.g. if one discourse actor positions a risk as more relevant than another or denies the very existence of a risk which others see as worrying.

Two competing concepts, e.g. ›fracking poses a risk to drinking water‹ vs. ›fracking does not pose a risk to drinking water‹ can be called an *agonal center* (see Felder 2015). An agonal center describes two positions that are regularly voiced in a discourse (possibly by different discourse actors who may use various ways to phrase them). The actual phrasing of the agonal center is a deliberate definition act by the discourse researcher and is thus an abstraction of several different occurrences of the opposing positions in the corpus. One may argue that this seems to be a rather simple dichotomy – however, the deliberate contrasting of different concepts into dichotomies may help to sort different positions and get an overview of discursive

stances. By deliberately reducing the positions to simple dichotomies, it is possible to analyze different issues that are at play and to see how they are used in combination. In a concrete analysis, this still allows researchers to consider that the dichotomous concepts may very well be abstract endpoints of a scale and that positionings between these two are of course possible. Indeed, these positionings of discourse actors in-between the contrasting sides may be what eventually leads to compromises. The dichotomies can help us see where discourse actors (be they politicians, governments, companies etc.) fall on this spectrum; it also allows us to compare whether the same extreme points of the scale occur in different corpora (e.g. if we compare between languages, publications or points in time in a diachronic approach). It should also be pointed out that in the case of highly frequent additional viewpoints that do not seem to belong to either side of the agonal center and are contrasted with both, a third agonal center can sometimes be formulated in order to make the complexity of a controversy analyzable (see Mattfeldt 2018b, 300). Usually however, the dichotomy itself allows for a more distinct approach to agonality.

The agonality framework has been used to analyze discourses, especially such discourses in which knowledge is contested and in which different discourse actors aim to establish their own perspectives as leading paradigms. Examples include Warnke (2009) (on the general relevance for discourse linguistics), Freitag (2013) (on the discourse on genetic engineering), Rothenhöfer (2015) (with respect to emotions), Felder, Luth, and Vogel (2016) (on legal contexts), and Mattfeldt (2018b) (in a multilingual analysis to describe conflict depiction concerning the Scottish independence referendum of 2014 in German and Scottish print media). In all these approaches, agonality is seen as an underlying characteristic of discourse:

The notion of agonality and agonal centres goes beyond mere conflictive issues: it acknowledges that knowledge is established via debates in society and that conflicts and polar oppositions shape the way in which we construct the world. The idea is that opposing views on a topic and the concomitant conflicts are integrated into texts; they can not only be expressed explicitly, but may also be implied, alluded to and marked linguistically [...] so that detailed linguistic analysis is required to trace them. (Mattfeldt 2018b, 55).

Agonality can be analyzed both with qualitative and quantitative approaches; a method that combines both is often the most successful approach and shall be used here as well. There are different linguistic ways that implicitly or explicitly signal opposition and which can be used in an analysis of agonality. Mattfeldt (2018a) groups these different indicators into twelve dimensions of agonality, which include e.g. explicit signals of contrasting (with expressions such as *conflict*, *argue*, *despite*), distinctions between the relevance of positions (e.g. with comparative adjective forms), the voicing of negative emotions (e.g. *fear* or *anger*), or temporal contrasts (e.g. using temporal adverbs or a change of grammatical tense) that often contain an evaluative component. Each of these indicators can have a relation to the establishment of the concept of risk; for example comparative adjective forms may be used in order to show what is prioritized and what is not; evaluative language and the establishment of contrast may show how a risk (or the potential of fracking) is evaluated by discourse actors, and the depiction of negative emotions can give a hint at how risk is perceived, e.g. when it comes to fears. Some of these indicators, e.g. *fear*, are also included in Müller's and Stegmeier's (2019, 319) corpus linguistic analysis of risk words that aimed at describing the concept of risk in more detail.

Several analyses of agonality use adversative and concessive connectives (such as *although* or *but*) as a starting point for a quantitative analysis of agonality: For example, Felder (2012) uses German connectives (e.g. *aber* [*but*], *jedoch* [*however*]...) in order to study the discourse about the Berlin Wall. For two reasons, these connectives are a suitable and helpful starting point for a discourse linguistic analysis of agonality (see Mattfeldt 2018b): 1) they are discourse-unspecific expressions that can occur in very different texts, which means that this starting point is not likely to be influenced by any bias on the researcher's part. 2) they oppose two (or sometimes more) different positions within one or two sentences, which means that the nouns, verbs, and

Table 1. Corpus overview.

US	UK	Germany
3592 texts	4096 texts	2766 texts
2,798,896 tokens	2,747,994 tokens	1,116,337 tokens

adjectives in the context can be seen as aspects that may be interesting for a further analysis of conflicts; their collocates are thus of particular interest.

The analysis in section 4 starts out by using such adversative and concessive connectives of German and English, namely *but/although/though/however/despite* and *aber/obwohl/trotzdem/jedoch/trotz*. These synsemantic connectives are a starting point for an analysis of their lexical collocates.¹ In a second step other expressions and patterns from Mattfeldt (2018a) are used in order to find conflictive potential in specific conflict settings (e.g. passages in which different eras are compared unfavourably, which may be signaled when using several time adverbs, or instances where a discourse actor is accused of obscuring risks, expressed by words such as *scheinen* (to seem), *Lüge* (lie) etc.). The full overview of the dimensions and the German and English expressions that can constitute agonality in each dimension can be found in Mattfeldt (2018a, 187). On this basis, section 4 presents detectable agonal centers that shape the fracking discourse.

Regarding linguistic means, this approach deliberately uses a broad approach in order to find out more about linguistic means that evoke the concept of risk. It includes both lexical and grammatical approaches by looking at conflicts in general and at how risk may implicitly play a role. Müller and Stegmeier (2019) use a frame-based approach that takes lexicon and grammar into account as well in order to look at risk as a concept that can be phrased in different ways in newspaper articles on renewable energy. Here the agonality approach is used to examine how the concept of risk is construed in depictions of conflicts.

3. Corpus

The media play an important role in the perception of risks concerning fracking. For this reason, the corpora analyzed here are newspaper corpora (including online versions), which were collected using the Nexis (2004-) database. While social media grow in impact when perceiving discourses, newspapers were chosen here due to the variety of domains within one publication – several aspects of an issue may find their way into sections on politics, economy, or the feature pages. The group sources suggested in Nexis contain a variety of regional and national newspapers in the UK, the US, and Germany, such as *The Guardian*, *The New York Times*, *Die Welt*, and many regional newspapers. The data consisted of text files and contained mainly the raw text, i.e. no images. Professional journals were excluded from this analysis to keep the journals comparable. The online versions or blogs of these newspapers were also taken into account.

The articles collected in the corpus include different text types, e.g. commentaries, columns, reports, editorials, or letters to the editor. All of them contain the word *fracking* or the scientific terms *hydraulic fracturing/hydraulisch² Frakturierung* and appeared up to July 2013, a time when the issue was debated heatedly in Germany (Table 1).

The table shows that the US corpus and the UK corpus contain more texts on this issue; however, in order to get a comprehensive perspective on differences between risk constitution in fracking discourses, these corpora have not been reduced to a smaller size.

4. Analysis³

4.1. Agonality in fracking discourse: a first approach

In the following, we look at the starting point of the agonality analysis, namely the search for collocates of the chosen adversative and concessive connectives (see section 2). This can provide a first overview of lexical and grammatical items that might be interesting for a closer look at

Table 2. Lexical collocates of adversative and concessive connectives⁴.

Corpus	Lexical collocates of adversative and concessive connectives
US	<i>gas, said, drilling, oil, state, new, natural, energy, water, fracking, mr., industry, shale, environmental, year</i>
UK	<i>gas, shale, energy, fracking, said, uk, oil, new, year, government, prices, water, well, power, production, potential, drilling, people, environmental, industry</i>
Germany	<i>können, Fracking, geben, müssen, wollen, sollen, Jahr, groß, machen, gut, Deutschland, kommen, USA, gehen, Land, Gas, dürfen, Verfahren</i> [can, fracking, give, must, want, shall, year, big, make, good, Germany, come, USA, country, gas, may, method]

the conflicts discussed in their vicinity. Collocates are words that occur in the context of another word with significant frequency (Scott and Tribble [2006, 36] use the fitting analogy of a friendship between two words). Table 2 shows the lexical collocates of the chosen adversative and concessive connectives (function words such as *and* have been excluded):

These lexical collocates already show some of the similarities and differences within this discourse. Some of the expressions (e.g. *shale, drilling, Verfahren [method]*) are part of the description since most articles contain an explanation how the drilling technique works. Other expressions focus on the innovative component of fracking (e.g. *new*) or possible restrictions (*dürfen [may]*). Some are similar (e.g. the focus on *water*, which shall be examined in 4.2), others differ (e.g. *prices* in the UK corpus). This list gives a first insight into which expressions occur in the context of the connectives; however, to determine which of these may be of interest when looking at risk, the concordances are regarded in detail. Other linguistic expressions of agonality (see section 2) are also analysed regarding their concordance lines and collocates.

Using these quantitative and qualitative approaches, several aspects that are of interest with regard to risk communication can be found, specifically risks to drinking water (4.2), earthquake risk (4.3), economic and social risks and chances (4.4 and 4.5) and comparisons between risks and chances of different energy sources (4.6). The agonal centers are determined by taking the adversative and concessive connectives as a starting point. Then the collocates are regarded in more detail, e.g. by studying concordance lines. This more qualitative step enables the researcher to see what exactly is discussed and may be of conflictive nature. The concepts that emerge by doing this are grouped into dichotomies, namely the agonal centers.

4.2. Similar risk constitution: risk and water

One agonal center that shapes the media communication about fracking can be phrased as follows:

›Fracking poses a risk to drinking water‹ vs. ›If used correctly, the fracking technology does not pose a risk to drinking water‹

*Water/*wasser* occurs in the vicinity of several patterns that denote agonality. The danger for water is phrased in different ways, as we can see in the following examples:

- (1) Sensiblen Grundwasserschichten kommt man daher viel näher als früher. Geologe Sass rät daher zur Zurückhaltung. (Stuttgarter Nachrichten, October 20, 2012) [One comes a lot closer to sensitive groundwater beds than before. Therefore, geologist Sass advises restraint. (translation by the author)]
- (2) "No one wants to admit it, but at some point, even with reuse of this water, you have to confront the disposal question," said Brent Halldorson, chief operating officer of Aqua-Pure/Fountain Quail Water Management, adding that the wastewater contains barium, strontium and radioactive elements that need to be removed. (New York Times, March 2, 2011)

- (3) Fracking could ruin German beer industry, brewers tell Angela Merkel; German brewers have warned Chancellor Angela Merkel that any law allowing the controversial technique known as fracking could damage the country's cherished beer industry. (telegraph.co.uk, May 23, 2013)

(1) contains several expressions related to risk in different ways: something that is sensitive ("sensiblen"), such as water, should be treated carefully; the situation is different and riskier than before ("viel näher als früher") due to fracking; and restraint ("Zurückhaltung") due to these risks is recommended. Water is framed as a good of considerable value (which means that the stakes in this risk are high), with the fracking technology as something that endangers this good. (2) refers to the meta level of risk communication: "no one wants to admit it, but" denotes a discrepancy between ontological reality (namely that disposing of the wastewater might pose difficulties) and communication about fracking. The connective "but" constitutes this contrast, which illustrates the relevance of these connectives for an agonality analysis. Thus, this excerpt not only denotes a risk to water but also points out a perceived lack of transparency about this risk, which is a huge issue in fracking discourse, (specifically in the US corpus from which this excerpt is taken). Finally, example (3) hints towards an interesting difference regarding risk and culture. Although risks that fracking may pose to water are an important issue in all three corpora, there are still some differences. The German corpus contains 21 mentions of *Brauwasser** (brewing water) and more than 50 mentions of *Brauer/Brauereien* (brewer/breweries), and it discusses specific risks to the beer industry. This is a constitution of risk that is specific to the German corpus, which is a first sign that what we perceive as a considerable risk is partly influenced by culture. The example here is a singular one from the UK corpus and refers specifically to the German discussion between the brewers and Chancellor Angela Merkel, as seen through a cultural filter.

An interesting point that can only be commented on in passing here is the visual component of media discourse, which plays a huge role when it comes to the public perception of the risk to water. Adams (2016) points out that not every risk is perceived by the entire public; many risks can only be understood by scientists. In this case however, the articles mention proof for the risk to water in the form of pictures and videos:

- (4) Was völlig unmöglich erscheint, ist in diversen Gemeinden an der amerikanischen Ostküste Realität: Ihr Trinkwasser enthält neuerdings brennbares Erdgas, Brunnen werden unbrauchbar, erboste Anwohner stellen Videos wie das vom brennenden Wasser zu Hunderten ins Internet. (Welt Online, April 26, 2012) [Something that seems completely impossible is a reality in several communities on the American East Coast: Of late, their drinking water contains inflammable gas, wells become useless, angry residents post hundreds of videos such as the one with the burning water online.]

These videos of burning faucets in private kitchen sinks are shared online and are thus easily visible for discourse participants outside the US as well. They can overcome the language and discourse barrier and thus may change risk perception considerably. The cognitive and emotional impact of visual images has been described as a picture superiority effect (Geise and Brettschneider 2010, 72). Pictures such as these may also show the severity of a risk and render a risk more frightening in the public perception.

4.3. Different risk constitution: risk and earthquakes

Despite some differences, the risk that fracking may pose to water is discussed in all three corpora. However, another possible risk is almost only discussed in the UK corpus, namely the question whether the usage of the fracking technology could cause earthquakes.

After concrete incidents in the north of England, the British press reported these earthquakes, pointing out that tests for fracking had been carried out in these communities. Whether these

drillings were the cause for these tremors or whether this was just coincidental is discussed in detail and can be summed up as a second agonal center:

›Fracking causes earthquakes‹ vs. ›Fracking does not cause earthquakes‹

The word *earthquake* occurs frequently with agonal expressions (both lexical and grammatical) and is a highly significant keyword in the UK corpus in general, in contrast to the US corpus or *Erdbeben* in the German corpus. This demonstrates the relevance of a national filter; since the tremors occurred in England, this seems to make them only newsworthy for the UK readership. However, the technology might pose the same risks towards other regions – after all, the drilling technique is the same. The national filter that newspapers seem to apply here influences the perception of risk in the corpora even though the ontological risk itself is probably roughly the same in all three countries.

How is the risk of earthquakes discussed? The following examples shall illustrate the actual risk communication and the relation to agonality:

- (5) A group of independent experts found last month that the use of fracking to extract the shale gas had likely caused the recent earthquakes across the north-west. (Morning Star, November 24, 2011)
- (6) The scientists rightly point out that tremors resulting from subterranean meddling are nothing new. Half of all the UK's earthquakes in the last 100 years were caused by coal mining. They also rightly highlight that the biggest vibration likely to result from gas fracking – about magnitude three – might crack the plaster in a house unlucky enough to be overhead, but it will not rend Lancashire asunder. (Guardian, April 17, 2012)
- (7) The saga of the trivial Lancashire tremors sums up the vacuity of the Coalition's energy policy. (Mail Online, March 24, 2013)

These examples show the competition between the two positions in the agonal centre. Several articles make a connection between fracking and the earthquakes (“likely caused the recent earthquakes” in (5)). Interestingly, the articles that take the other position do not deny that tremors did occur. However, some point out that there might be other causes (e.g. coal mining in (6)). Even more often, the relevance of the tremors is discussed. Mattfeldt (2018b) lists expressions such as *trivial* (see (7)) as an expression in the dimension “agonality of relevance competition”: the earthquakes may not be that important (and, we may conclude, should perhaps not be considered for decisions about fracking). The slightly ironical conclusion “it will not rend Lancashire asunder” (6) renders the incidents almost not newsworthy. The risk of an earthquake is acknowledged due to the tremors in Lancashire, but both the causes and the relevance are disputed. This agonal discussion in Britain might also be the very reason why the risk of earthquakes is not reported on in the US or Germany. If the relevance seems debatable and journalists from the US or Germany agree with those discourse actors who deem the tremors “trivial”, they may perceive the risk as not newsworthy for their own audience.

4.4. Risk and chances: economic factors

Safety risks such as danger to drinking water or fears of earthquakes are to be expected in the fracking discourse (see also the findings of Müller and Vogel 2014 in energy discourses). Other aspects may be less obvious issues, but also play an important role in fracking discourse. This section shall discuss economic questions that occur with expressions and patterns of agonality. Furthermore, for this section the possible benefits of fracking also play a role – after all, reasons for taking these risks at all must also be communicated.

The economic discussions, which focus mostly on the potential of fracking, can be summed up in the agonal center

Table 3. Clusters with *potential* in the UK press coverage on fracking⁵.

Rank	Frequency	Cluster
1	262	<i>the potential to</i>
2	190	<i>the potential for</i>
3	160	<i>has the potential</i>
4	106	<i>the potential of</i>
5	99	<i>shale gas potential</i>
6	62	<i>about the potential</i>
7	55	<i>potential of the</i>
8	53	<i>of the potential</i>
9	47	<i>have the potential</i>
10	47	<i>new potential energy</i>
11	47	<i>potential energy resource</i>
12	46	<i>and the potential</i>
13	44	<i>potential shale gas</i>
14	43	<i>potential for shale</i>
15	41	<i>with the potential</i>

›Fracking can boost the economy considerably‹ vs. ›Fracking will not have a huge economic impact‹

It is noteworthy that the agonal discussion of chances is also an attempt at evaluating what the future will hold, which resembles the discussions of risk. Indeed, risks and chances seem intertwined, especially when it comes to the evaluation of probability and the severity/benefit of the outcome (see a critical discussion of this relation in Rosa [2010]).

Table 3 with clusters of *potential* in the UK fracking corpus illustrates the relevance of this aspect. Specifically rank 5, 10, 11, 13 and 14 show how closely this potential occurs in the context of shale gas drilling itself.

The first part of the agonal center is usually voiced when the US is concerned, both in the US corpus itself and in the German corpus:

- (8) "The oil industry is runnin' and gunnin,'" Myers said. "The opportunities are astounding." (Star Tribune Minneapolis, October 16, 2011)
- (9) Mindestens 24 Milliarden Barrel Öl, so viel wie das Scheichtum Katar besitzt, womöglich sogar zwanzigmal mehr, lagern nach Schätzungen von Experten hier in einem gigantischen unterirdischen Schieferfelsen. Mehr als genug, um Amerikas Öldurst, der fast ein Viertel der weltweiten Produktion verschlingt, für einige Zeit zu stillen. (Zeit Online, 19.7.2012) [According to experts, at least 24 billion barrels of oil – as much as the sheikdom Qatar owns – lie here in a gigantic underground shale rock. More than enough to quench America's thirst for oil, which devours almost a quarter of the worldwide production, for some time. (translation by the author)]

Superlatives ("mehr als genug" (9)) and adjectives of positive evaluation ("astounding" (8), "gigantischen" (9)) paint the picture of a bright future for the US-American economy thanks to fracking. Other texts debate the new powerful role of the US in the energy market, asking explicitly whether this may shift global relations. Some compare fracking to the gold rush, which may constitute fascination with the new technology by relating it to a legendary historical event. To sum up, taking risks when so much could be gained is constituted as acceptable from this position.

The potential is regarded differently for Germany due to regional conditions:

- (10) Selbst wenn man in Deutschland und Europa das Fracking-Verfahren mit Einhaltung aller hohen Umweltstandards teilweise wirklich nutzen sollte, so ist die Erwartung paradisischer Zustände wohl eher übertrieben. (abendblatt.de, March 18, 2013) [Even if the fracking procedure was to be used in Germany and Europe, meeting all the strict environmental standards, the expectation of a paradisiac state of things seems rather exaggerated. (translation by the author)]
- (11) „Die unkonventionelle Gasförderung hat in den USA zu sinkenden Energiepreisen und zum Aufschwung der Industrie geführt“, sagte Tobias Knahl, Abteilungsleiter für Energie

und Umwelt bei der Handelskammer. „Diese Entwicklung geht teilweise zulasten Europas. Auch in Europa und Deutschland finden sich große Vorkommen. Die Erschließung ist hier wegen der dichten Besiedlung zwar schwieriger. Dennoch sollte im Rahmen der Energiewende auch an die unkonventionelle Förderung gedacht werden.“ (Die Welt, February 16, 2013) [“Unconventional gas drilling has resulted in sinking energy prices and an industrial upswing,” says Tobias Knahl, head of the energy and environment department at the chamber of commerce. “This development happens partly at the expense of Europa. There are huge sources in Europe and Germany as well. On the one hand the exploitation is more difficult here, on the other hand one should think about the unconventional exploitation in the context of the energy revolution. (translation by the author)]

In contrast to the US, where even discourse actors opposed to fracking do not doubt the economic potential, we can see both sides of the agonal centre in the German corpus. (10) shows a lot of concessive indicators of agonality (“selbst wenn”, “mit Einhaltung aller”). A possible future in which fracking is practiced in Europe is described as both unlikely and not very promising. This corresponds to the second part of the agonal center, ›fracking will not have a huge economic impact‹. (11) also concedes that there may be difficulties due to the dense population (“schwieriger” [more difficult], an adjective used in the comparative form, which distinguishes the conditions from the US discourse) but also points out the potential. The concession here is interesting: one can read it as an obstacle or as a rather veiled concession that there may be risks to the population if fracking is done closely to human settlements. All in all, the possible chances play a much more important role when discussing conditions in and predictions for the US.

4.5. Risks and chances: social factors

Social risks and chances are also discussed, which might not be expected in a debate about energy production. Again, this is described in detail when it comes to the US, both in the US corpus and in long feature articles in the German corpus that depict the situation in places where fracking is already common. The positions can be summed up in the following agonal centre:

›Fracking has positive social outcomes‹ vs. ›Fracking has negative social outcomes‹

The articles in the US corpus focus mainly on the chances, as illustrated by the following examples:

- (12) “These gas people have brought new life to this town,” he said. “Before, it was almost like a ghost town.” (Pittsburgh Post Gazette, August 9, 2011)
- (13) While the biggest incentive would be cheaper household energy bills, communities who agree to shale-gas extraction in their area could also [sic!] be offered funding for new sports clubs or community centres and other local amenities, according to the Financial Times. (telegraph.co.uk, April 29, 2013)

These quotes show another facet of agonal positioning, namely a sharp time contrast (see the change in tense and the adverb *before* in (12) and the adjective *new* in (12) and (13)). Two worlds – one with fracking and one without – are construed. Positive outcomes (“new life” in (12)) are pointed out in interviews with locals. These social benefits, which might be possible for Britain as well according to the second quote, are a secondary effect. Fracking is not practiced in order to help economically underdeveloped regions, but may still have this outcome at least for some regions, which becomes part of the discourse.

The feature articles in the German corpus constitute the other position of the agonal centre as well, namely possible negative outcomes of fracking:

- (14) Reinkes Concordia Lutheran Church zu Williston, North Dakota, gewährt rund 50 obdachlosen Männern Obhut in ihren Räumen oder, den Glücklicheren mit eigenem Auto,

auf dem Parkplatz. Zu viele. Reinke schickt, mit schlechtem Gewissen, Dankgebete zum Himmel für jeden, den er abweisen kann, wegen Alkohol, Drogen, Aggressivität. (Welt Online, May 20, 2013) [Reinke's Concordia Lutheran Church in Williston, North Dakota, gives shelter to around 50 homeless men in its rooms, or in the parking lot for the lucky ones with a car. Too many. Feeling bad, Reinke thanks heaven for everyone he can send away because of alcohol, drugs, aggressive behaviour. (translation by the author)]

- (15) Allein die Versorgung mit Lebensmitteln wird in Williston mit seinen 15 000 Einwohnern zu einem täglichen Kampf. Walmart ist oft ausverkauft, McDonald's schließt manchmal schon am Mittwoch, weil die Frikadellen ausgehen. Manche Geschäfte finden kein Personal, die Jobs in der Ölindustrie sind viel attraktiver. (Stern, November 29, 2012) [The food supply alone is becoming a daily struggle in Williston with its 15000 inhabitants. Walmart is often sold out, sometimes McDonald's closes on Mondays because they run out of hamburgers. Some stores cannot find staff; the jobs in the oil industry are much more attractive. (translation by the author)]

These quotes show strains to the social fabric of the towns in fracking regions from an outside perspective. Negative emotions (such as the reverend's guilty conscience (14)) are mentioned as well as the inability to cope with the sheer amounts of people with needs. This is described as a fight ("Kampf") in the small town. The dynamics in a community seem to shift. The descriptions are often not openly critical of the developments. However, they allude to possible risks as unwelcome outcomes (see section 2) due to these rapid changes, e.g. when people have to sleep in their cars due to the housing shortage (14). The conflictive potential of this situation can be described within the broad term of agonality.

4.6. Weighing risks: fracking, renewable energy, and the question of climate change

Risks and chances also play a role when fracking is compared to other ways of producing energy. Proponents and opponents of the various options – shale gas, oil, solar or wind – point out different risks and benefits. Analyzing this part of the discourse can also reveal the status that these competing options have obtained. Most of the comparisons between renewable energy and fracking are drawn in the UK press:

- (16) By abandoning wind, nuclear and other failed, risky or dubious 'renewables', and exploiting the benefits of shale gas, we can simultaneously boost our economy and shrink our national carbon footprint. It would be irresponsible to ignore such an opportunity. (Mail Online, March 17, 2013)
- (17) You should be in no doubt that the roaring protests against fracking will make the opposition to wind farms look like a gentle breeze. Wind turbines are entirely harmless beyond changing the view: fracking, if done badly, risks polluting water and leaking methane. (guardian.co.uk, June 6, 2013)

(16) ascribes negative properties to renewable energy source using adjectives of negative evaluation like "failed", "risky", "dubious". In this description, renewable energy sources are constituted as posing a risk. It is noteworthy that only the benefits of shale gas energy production are mentioned; risks are only communicated with respect to renewable energy. Interestingly, climate change is evoked here. ›Fracking can positively affect climate change‹ is a concept that is sometimes evoked in this context, which paints fracking as a technology that may reduce the risk of climate change and thus be ecologically advisable (see below).

The Guardian also mentions the *opposition to wind farms* (17). Several indicators of agonality show the different aspects of the discussion here. An actual contrast is established regarding risk: *harmless* wind turbines are contrasted with fracking, which *risks polluting water and leaking*

methane. Fracking appears as the grammatical agent here and thus as something that deliberately takes this risk. Furthermore, the agonality is apparent when the meta discussion is alluded to. Future *roaring protests* against fracking are said to be more massive than the initiatives against wind energy. The benefits of neither are constituted here.

These examples show that a discourse around one form of energy production (like fracking) may touch upon related discourses. As we can see there are references to agonal discussions about wind energy, even though the Guardian constitutes this discourse as an aesthetic discourse rather than communication about considerable risks. The question of climate change arks over many of these comparisons as a discourse that permeates all these various energy production debates. Climate change repeatedly comes up as a risk that needs to be avoided. Fracking being a relatively new form of energy production, there is still an agonal discussion about its effects regarding climate change and whether its effects are positive, negative, or non-existent.

5. Discussion

In this paper, risk depiction in fracking media discourse was analysed from a linguistic viewpoint, using the framework of agonality as a general opposition in discourse. Expressions that denote contrasts in various ways – from grammatical means like connectives or temporal adverbs to lexical indicators such as evaluative adjectives or expressions denoting emotions – were searched in the three corpora. The collocates and concordance lines were analysed in more detail. Many of them, especially the references to water, relate to risk as a concept that denotes undesirable outcomes. The conflicts were described using agonal centers as dichotomies that show opposing positions. As a result, we can see that risks are voiced and debated in a lot of conflictive contexts in the fracking discourse and that there are very different risks (and concepts of risks) at play, even some that are relating to the social fabric of communities, which might not have been expected. Risk as a concept here includes psychological aspects such as fears, economic deliberations or the description of a new situation as negative or positive. The study illustrates how risks may be constituted by evoking these different aspects of risk as a concept with different semantics that all come into play in this discourse. Apart from explicit references to risk, implicit constitutions of risks also play an important role, e.g. when describing outcomes using negative evaluative adjectives, contrasting two time periods (e.g. before and after the beginning of fracking) or allusions to difficulties.

Some of the agonal discussions around risks and benefits of the fracking technology are part of all three corpora, especially the possible risks of groundwater pollution or the economic potential that fracking might have for the US. However, the study also illustrates the fact that even an ontological given such as the very same technology is discussed differently in different countries and languages. This tendency was also visible in the analysis of climate change newspaper discourse by Grundmann and Scott (2014). When it comes to fracking, there is a clear national filter, e.g. when it comes to earthquakes. Even though this might be a risk for all regions in which fracking is practiced, this particular risk is only constituted in the UK corpus. Risks may not stop at national borders but, at least to some extent, risk communication does, at least when it comes to fracking. Why this is the case is difficult to tell exactly. However, several reasons might apply here: the political decisions are made on a national and/or communal level and the possible consequences of fracking will be particularly noticeable in the regions where fracking is actually used (which also explains why many local newspapers report on this process as well as initiatives against it). In other contexts, specifically when it comes to social changes in the US due to fracking, developments in other countries are however described from an outside perspective in feature articles that paint a panorama of the situation.

6. Conclusion

Lastly, one may ask whether what was studied here was one risk discourse or whether, in fact, three separate discourses on fracking were analysed (see also Mattfeldt 2018a, 370–373). On the one hand, there were similarities between the concerns and hopes concerning fracking that were constituted in the discourses and the risks that were deemed to be newsworthy. On the other hand, there were considerable differences in the portrayal of risks due to the different political, geographical, cultural, economic, and social conditions in each country. Also, different other discourses affected the discussion about fracking. While climate change was constituted as a risk in all corpora, the comparisons to other energy production forms and the discourses surrounding them differed considerably. For example, a controversial discourse surrounding wind energy in the UK affected the discussion of fracking risks as well, which was not the case for the German or the US corpus. These differences lead to the conclusion that a description as three separate discourses with variations in which risks are constituted may be more fitting.

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Notes

1. T-Score, 10 tokens to the left and to the right. The software used for the analysis is AntConc (Anthony 2014). The T-Score of collocations was used in order to find relations between words in a way that takes frequency into account (see Hunston 2002, 72). The T-Score was used as a measure “not of the strength of the association but the confidence with which we can assert that there is an association” (Collins Word Bank 2008).
2. ! is used as a wildcard setting in Nexis.
3. For a more detailed discussion of the following analysis see Mattfeldt 2018a, chapter 5.2.
4. This table is an adaptation from Mattfeldt 2018a, 192. Modal verbs seem to play a larger role in the German corpus when looking at these collocates; this may already indicate a different way of discussing fracking.
5. This table is an adaptation from Mattfeldt (2018a, 219).

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