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IMPACTFUL, NEGATIVE, OR PROXIMATE HEATWAVES?

News Values in Heatwave Reporting in the Journalistic
Discourse of the United Kingdom and India

ABSTRACT

Elisa Heikkilä: Impactful, Negative, or Proximate Heatwaves?: News Values in Heatwave Reporting in the Journalistic Discourse of the United Kingdom and India

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This thesis aims to determine how heatwaves are represented and reported in news outlets of different political leanings in two target countries: the United Kingdom and India. Heatwaves have been called one of the most deadly and dangerous weather phenomena, and the frequency and intensity of them has increased due to climate change. As news media is one of the most used sources for information about climate change, it has immense responsibility and power over how climate change and its related phenomena, such as heatwaves, are understood by the public. News values are one way through which reporters choose what is “newsworthy” about a topic or event, and thus how to represent it.

The research questions of this thesis focus on how, and through which news values, are heatwaves reported in the target countries, and whether there are differences between the reporting of different political leanings or different nations. Four news outlets were chosen for analysis: one left-leaning and one right-leaning outlet from both target nations. These are *The Guardian*, the *Daily Mail*, *The Times of India*, and the *Hindustan Times*. The data for this thesis consists of news articles published in these outlets during the summer of 2023 in which at least one of the search terms *heatwave*, *heat wave*, *heatwaves*, and *heat waves* appears. Articles of each outlet were compiled into their own corpora, and the strongest collocates for the search terms were determined in each. The collocates were further connected to semantic categories, which were finally linked to news values to determine what representations and values were dominant in each corpus.

Previous research has described the news field in Britain as heavily politicised, which resulted in the hypotheses that there would be differences in reporting based on the outlet's political leaning and the differences would be stronger in the British outlets than in the Indian ones. Additionally, common characteristics for heatwave and climate reporting in both nations have been introduced in previous research. The findings of this thesis were similar to the previous research. Differences were found between the reporting of the two nations and political leanings, the latter more distinct in the UK's outlets. However, the news values emerging in all outlets were very similar. This suggests that there is some uniformity in heatwave reporting, even though differences do exist between the political leanings and nations.

Keywords: corpus-based discourse analysis, news values, heatwaves, news media discourse, the United Kingdom, India

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TIIVISTELMÄ

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Tämän pro gradu -tutkielman tavoite on tutkia, kuinka lämpöaalloja on representoitu eri poliittisten painotusten uutiskanavissa kahdessa kohdemaassa: Iso-Britanniassa ja Intiassa. Lämpöaalloja on kutsuttu yhdeksi tappavimmista ja vaarallisimmista sääilmiöistä, ja ilmiön vakavuus ja toistuvuus on kasvanut ilmastonmuutoksen seurauksena. Koska uutismedia on yksi käytetyimmistä tiedonlähteistä ilmastonmuutosta koskevista asioista, sillä on merkittävä vastuu ja valta vaikuttaa siihen, kuinka ihmiset ymmärtävät ilmastonmuutoksen ja siihen liittyvät ilmiöt, kuten lämpöaallot. Uutisarvot ovat yksi tapa, jonka kautta journalistit voivat päättää kuinka kehystää ilmiötä.

Tämän tutkielman tutkimuskysymykset keskittyvät siihen, millä tavalla ja minkä uutisarvojen kautta lämpöaalloista uutisoidaan kohdemaissa, sekä siihen onko uutisoinnissa eroja joko poliittisten suuntausten tai maiden välillä. Neljä uutiskanavaa valittiin analyysin kohteeksi: yksi vasemmalle ja yksi oikealle poliittisesti painottuva lehti kummastakin maasta. Nämä ovat *The Guardian*, *Daily Mail*, *The Times of India* ja *Hindustan Times*. Tutkimuksen data koostuu näissä lehdissä kesän 2023 aikana julkaistuista uutisartikkeleista, jotka sisältävät vähintään yhden neljästä hakutermitistä. Hakutermit ovat *heatwave*, *heat wave*, *heatwaves* ja *heat waves*. Jokaisesta uutiskanavasta löydettyt artikkelit koottiin omiksi korpuksikseen ja vahvimmat kollokaatit kaikille hakutermeille määritettiin. Nämä kollokaatit yhdistettiin merkitystensä perusteella semanttisiin kategorioihin, jotka puolestaan liitettiin eri uutisarvoihin dominoivien representaatioiden ja arvojen selvittämiseksi.

Aiempi tutkimus on kuvannut Iso-Britannian uutiskenttää vahvasti politisoituneeksi. Tämä johti hypoteesiin siitä, että medioiden poliittisten suuntauksien välillä olisi eroja raportoinnissa ja nämä erot olisivat Iso-Britannian lehtien välillä suuremmat. Lisäksi aiempi tutkimus on määritellyt yleisiä piirteitä sekä lämpöaaltojen että ilmastonmuutoksen uutisoinnista molemmissa maissa. Tämän tutkielman tulokset olivat aiemman tutkimuksen kanssa saman kaltaisia. Raportoinnissa sekä kohdemaiden että poliittisten suuntauksien välillä oli eroja, joista jälkimmäiset olivat huomattavampia Iso-Britannian kuin Intian lehdissä. Dominoivat uutisarvot olivat kuitenkin kaikissa uutiskanavissa hyvin samanlaisia. Vaikka eroja on löydettävissä, lämpöaaltojen uutisoinnissa on myös merkittävää yhtenäisyyttä maiden ja poliittisten suuntauksien välillä.

Avainsanat: korpusanalyysi, diskurssianalyysi, uutisarvot, lämpöaallot, uutisdiskurssi, Iso-Britannia, Intia

Tämän julkaisun alkuperäisyys on tarkastettu Turnitin OriginalityCheck –ohjelmalla.

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1 Introduction

Heatwaves have been called one of the most dangerous weather phenomena (World Meteorological Organisation n.d., Met Office n.d. c) as they cause significant risks to both humans and non-human structures. The impacts range from excess mortality and intensification of pre-existing health conditions to decreased air quality and disruptions in health service delivery (World Health Organisation n.d.). As global temperatures are rising because of climate change, the frequency and intensity of heatwaves will also increase (ibid.).

Due to the growing recurrence and severity of the phenomenon, heatwaves are gaining more attention and reporting from the media. News media has been the second most used source of information regarding climate change (Robertson 2022), and therefore, it is vital how they represent and frame the issue and its related phenomena. One way of selecting what to concentrate on in reporting are news values. Bednarek & Caple (2014) define news values as the “newsworthy” features of events and phenomena that are created through discourse and influence what gets reported and how. Through producing distinct representations and specific news values when reporting about heatwaves, news outlets can influence how heatwaves and their impacts are understood by the wider public. This makes the reporting of news outlets regarding the topic of heatwaves an important area for research, and thus also the subject of the present thesis.

Even though heatwaves are a global phenomenon, the risks they pose can differ between nations. For example, preparedness for extreme heat, number of resources, socioeconomic status, and urbanisation affect the amount of risk that heatwaves create, and these factors vary between nations, especially between the Global North and the Global South (World Health Organisation n.d., World Meteorological Organisation 2023). Therefore, two nations representing the Global North and South respectively were chosen for analysis: the United Kingdom (the UK) and India. According to the ND-GAIN Country Index (Notre Dame Global Adaptation Initiative 2021), which gives a score of a nation’s vulnerability to climate change and other global issues in contrast to its readiness for these

challenges, the UK is in the top ten while India is number 116, clearly demonstrating the countries' differences in preparedness and adaptability, which are directly related to the amount of risks caused by heatwaves. As the threat posed by heatwaves varies between these two countries, they are a fitting source for analysis to evaluate whether the different contexts of and dangers from heatwaves create variation in the reporting and respective representations.

This thesis focuses on analysing how heatwaves are represented in journalistic discourse in British and Indian news outlets. The representations are analysed based on Bednarek & Caple's (2014, 2017) theory of news values. Four outlets have been chosen for the focus of analysis: one left-leaning and one right-leaning outlet from each nation to account for the political nature of journalism. These are *The Guardian*, the *Daily Mail*, *The Times of India*, and the *Hindustan Times*. This thesis aims to discern how, and through which news values, heatwaves are reported and represented in the target outlets. The method of analysis is corpus-based discourse analysis, utilizing quantitative methods from corpus analytics and qualitative methods from discourse analysis. The analysis focuses on the strongest collocates for the search terms *heatwave*, *heat wave*, *heatwaves*, and *heat waves* based on MI score. The collocates will be analysed and grouped into semantic categories to see what kind of representations of heatwaves these outlets create. The categories will be further connected to news values to see which news values are dominant in the discourse. This thesis has three research questions:

1. In what ways, and based on which news values, do the British and Indian news outlets in question represent heatwaves?
2. What kinds of differences are there between the representations of heatwaves in the left-leaning and right-leaning news outlets within the countries, and are the differences the same in both countries?
3. What kinds of differences can be found between the reporting in the two nations?

The reporting of heatwaves in journalistic discourse has been studied previously in the field of linguistics, among others. However, the topic of heatwaves has rarely been analysed through both the method of corpus-based discourse analysis and the use of the theory of news values. In addition, the comparison of British and Indian media will bring this combination to a new context, which makes this research valuable. As heatwaves are continuously becoming more frequent and intense, analysis of timely and relevant data is also crucial, which this thesis focuses on.

This thesis consists of six chapters: following the Introduction, Chapter 2 covers the theoretical background for this thesis by introducing and defining the relevant concepts of discourse analysis, discursive frame of journalism, journalism and climate change, and representation of heatwaves in media. Previous research of these topics and their results are also covered. Chapter 3 introduces the material collected and analysis method used in this thesis, with a separate sub-section focusing on the main method, corpus analysis. Chapter 4 describes the results of the analysis, with a subsection dedicated to each news outlet, further divided into sections for singular search words and plural search words. Chapter 5 discusses the results in relation to previous studies and theoretical background, answering all three research questions. Lastly, Chapter 6 concludes this thesis and introduces suggestions for further research on the topic.

2 Theoretical Background

This section covers relevant concepts and terms for analysing representations of heatwaves in news discourse. This theoretical background is divided into four sub-sections: 2.1 Discourse Analysis, 2.2. Discursive Frame of Journalism, 2.3 Journalism and Climate Change, and 2.4 Representation of Heatwaves in Media. In Chapter 2.1, the definition of *discourse* in this thesis is stated and the relevant concepts of representation, connotation, and framing are introduced. Chapter 2.2 introduces discursive features of journalism in general followed by nation-specific features of the UK and India. Chapter 2.3 describes journalism's relationship with climate change, and lastly, Chapter 2.4 defines what heatwaves are and describes the phenomenon's representations in media through findings of previous studies.

2.1 Discourse Analysis

The term *discourse* has several different but often related meanings both between different fields and within them (Baker 2006, 3). In linguistics, discourse has been defined as “language above the sentence or above the clause” (Stubbs 1983, 1) and “language in use” (Brown & Yule 1983), meaning a longer stretch of language that has occurred naturally. Furthermore, discourse has been defined as a context of language use, like media discourse, and as a topic of language use, like environmental discourse (Baker & Ellece 2011, 31). These two latter definitions highlight that language is used in diverse ways depending on the context, as suggested by Webb (2009, 55). To communicate anything, choices between words and grammatical forms must be made, and each possible choice can hold a different meaning (Taylor 2013, 18). These choices are usually influenced by the surrounding contexts. In this thesis, *discourse* is defined as naturally occurring, long stretches of language from a specific context (news media) and surrounding a specific topic (heatwaves). The terms used will be journalistic discourse, referring to the context of language use, and heatwave discourse and climate discourse, referring to the topics of language use.

Discourse analysis is the study of discourse. It has been defined as researching language in use, the meanings attributed to language, and the actions executed when using language within a certain context (Gee & Handford 2012, 1). Discourse analysis has focused on the meaning and structure of texts, but also on how power and inequality are constructed in language (Baker & Ellece 2011, 32). In discourse analysis, language is understood as evidence of societal phenomena (Taylor 2013, 7), which means that the use of a specific word or grammatical construction can be evidence of attitudes, norms, or other aspects of society. A cultural stereotype can be triggered by a single phrase, construction, or even a single word (Baker 2006, 13), and thus influence how we perceive our reality.

There are a variety of discourses surrounding any object of interest and each discourse can represent the object in a different way (Baker 2006, 4). Analysing these language choices that create a discourse can lead to a better understanding of the surrounding society and power structures within it, as language can be used to present a specific version of things as truth and those in powerful positions in society get to define what that truth is (Taylor 2013; 15, 19). For example, in climate discourse climate change can be described as a result of human causes or not through language choices. In other words, language influences how different things are represented. Representations can be called the mental image that language, or some other domain such as art, creates (Baker & Ellece 2011, 117). For example, the portrayal of women in a film can convey general attitudes toward women and also enforce them (Webb 2009; 8, 15). People's understanding of the world and one another is greatly influenced by representations (ibid, 8). Thus, the way a topic such as heatwaves is represented influences how it is understood and what it is understood to be.

The connections that representations create can be literal or connotative (Baker & Ellece 2011, 20). A literal connection means the connection between the signifying word and the mental concept for that same word, while connotative connections convey an additional meaning that often carries a positive or negative attitude (ibid.). For example, the word *blue* has a literal connection to the mental

concept of the colour blue, while its connotative connections have several culturally different meanings like royalty, sadness, or coldness (ibid.). Similarly, the term *heatwave* can evoke meanings beyond the literal phenomena that the word refers to. These connections could relate to, for example, positive representations or memories of enjoying the warm weather, or to negative ones of uncomfortableness or even danger.

In addition to representations influencing how a topic is understood, the pre-existing knowledge that each person has relating to the topic is used to understand it and produce discourses (Baker & Ellece 2011, 48). These are called frames. According to Lakoff (2004, xv), frames shape the way that each person sees the world. Framing a topic in a certain way encourages others to understand it in the same particular way (Kuypers 2009, 190) thus influencing what is perceived as real or true. Different frames can be established through language choices.

As established in this sub-chapter, language and discourse influence the way we understand our surrounding world which makes them important channels for using power. Because language choices are often not arbitrary and reveal underlying attitudes, they shed light on dominant perspectives toward topics. Especially the concepts of frames and representations and how they produce discourses will be central to this thesis.

2.2 Discursive Frame of Journalism

Journalism has been deemed a useful area of producing and reproducing discourses (Baker 2006, 72), and thus, journalists have the power to define and represent different topics. This power comes from the decisions that writers make when creating news. There is an enormous set of options on how to write about a specific topic from which reporters choose from, as it is impossible to account for events fully and impartially (Baker et al. 2013; 3, 26). The chosen viewpoint of reporting creates specific types of representations and frames of the reported object that might not be created if reported from a different perspective. As journalism has such a strong power to influence our understanding of different matters, it is important to understand how the journalistic discourse works and what

principles and habits guide reporting. This sub-section will first cover the discursive features of journalism in general and then cover nation-specific features of the UK and then India.

2.2.1 Journalism in General

Journalism is based on the idea of reporting. Reporting literally means bringing back or telling something that has been witnessed or gathered (Eide & Kunelius 2020a, 165). The practice of reporting is also the basis of journalism's authority (ibid.), as it helps the public to witness events around the world that have varying effects on their daily life (Eide & Kunelius 2020b, 162). This is the major reason why news is read. People want to understand and be informed of their surrounding world and use that information to build their own opinions on major global and national issues (Williams 2010, 6). Reading news grants the opportunity to belong to and take part in a democratic society through the shared common knowledge of events, phenomena, and the world in general that news creates (Rodrigues & Ranganathan 2016, 223-224).

However, as stated in Chapter 2.1, there are several ways of communicating about a topic which influence our understanding of it. Objective reporting of what has occurred is not the only motive for reporting and reading news. As other motivating factors, one can mention political agendas, entertainment, and scandals, among others (Eide & Kunelius 2020a, 165). These motivations for reporting can come from the journalist's or newspaper's own agenda but they can also arise from the will of the readers. All reasons to read news are not rational, they can also be emotional (Williams 2010, 6). People can, for example, read news to be entertained. This leads to reporters having the need to balance between educating people by "giving them what they need", on the one hand, and entertaining them by "giving them what they want", on the other (ibid., 13). News outlets must follow these desires of the readers, as the readers can refuse to read and buy news from sources that they disagree with (Baker 2006, 72). Many read the news to have their own prejudices and worldviews validated (Williams 2010, 6), and thus news outlets need to cater to their desired audiences and report in a way that attracts them in order to be successful.

As new events and phenomena constantly take place, journalists need to be able to define what things are worth reporting. These defining criteria can be called news values. Bednarek & Caple (2014, 137) define news values as “newsworthy aspects” of people, events, and phenomena that are created through discourse and exist in it. An event does not have an inherent newsworthiness, but the newsworthiness is given to the event by constructing specific news values while reporting (ibid., 139). If one topic is constantly associated with one news value, it heavily influences the representations and understanding of the topic. Bednarek and Caple (2017, 55) defined eleven news values of which nine are relevant to this thesis. Aesthetic appeal and consonance have been left out as they relate to factors beyond the scope of this thesis. These news values have been defined based on English-language news from Australia, the United Kingdom, and the United States, and thus these values might not be universal (ibid., 54) which is important to consider especially when analysing the news from Indian outlets. The nine news values used in the analysis of data in this thesis and their definitions are introduced in Table 1 below.

Table 1. News values modified from Bednarek & Caple (2017).

News value	Definition	Example defining characteristics
Eliteness	Elite status of human or non-human entities	Names of famous people or places, role labels, status-indicating adjectives (<i>beloved, prestigious</i>), descriptions of achievements (<i>selling millions</i>)
Impact	Having significant effects or consequences	Assessment of significance (<i>historical, crucial</i>) or representation of consequences
Negativity	Negative aspects, strongly context dependent	Mentions to negative consequences (<i>danger, death, disaster</i>), negatively evaluating language (<i>terrible</i>), or references to negative emotions (<i>distraught</i>)
Personalisation	Giving a story a human face	Pronouns and names or references to people’s emotions and experiences
Positivity	Positive aspects, strongly context dependent	Mentions to positive consequences (<i>success, help</i>), positively evaluating language (<i>brilliant</i>), or references to positive emotions (<i>joy, celebrate</i>)

Proximity	Geographical or cultural nearness	Location names, references to nations, inclusive first-person plural, or references to locality (<i>home-grown, here</i>)
Superlativeness	The more X the more newsworthy, high intensity or large scope	Superlative forms, intensifiers (<i>severe</i>), or quantifiers (<i>thousands</i>)
Timeliness	How current the event is or how relevant to the immediate situation	Temporal references, present and present perfect verb tenses, or references to current trends and seasonality
Unexpectedness	Evaluation of unexpectedness or uniqueness	Evaluation of unexpectedness (<i>different, strange</i>), references to surprise, percentages, or numbers

By framing a topic constantly through specific news values, that framing of the topic becomes established. According to Entman (1991, qtd. in Kuypers 2009), the established frame around a topic starts to guide the thoughts of audiences and journalists, which results in journalists reporting any further information on the matter according to that same frame. This highlights the importance of framing in news articles and how strongly it influences future representations of that same phenomenon. The dominant news values around a topic both create representations and influence frames, and these both guide how the public understands that same topic.

To summarize, journalism is a key area of producing and reproducing discourses. The frames and representations that journalism uses and creates are co-constructed by authors' motives and readers' opinions, each representation and frame influencing attitudes and future reporting of the topic. A key characteristic in framing news are news values, which are the features that make an event worthy of reporting. All these factors give journalism power to define how people understand topics, events, and phenomena.

2.2.2 Journalism in the UK and India

Both the United Kingdom and India have unique national characteristics in the contexts in which news is created. The news field of the UK is characterised by especially strong tabloidization. Tabloidization refers to a shift in both the form and content of newspapers to a more simplistic and

emotive format (Baker & Ellece 2011, 147). This has resulted in shorter articles, bolder headlines, and more visual material, while the content has shifted to more popular entertainment and stories that would have earlier been dismissed as “only fit for the tabloids” (Williams 2010; 10, 232). Even though this shift has occurred across the globe, it has been described as more “virulent” in the UK than elsewhere (ibid., 10).

In addition to strong tabloidization, news outlets in the UK have been described as strongly political and partial with clear allegiances to political parties (Baker et al. 2013, 8), which clearly relates to the level of trust an outlet gets as more opinionated sources often have lower levels of trust (Newman 2023b). In the United Kingdom, trust in the news has been declining since 2015 with the trust level of news overall at 33%, while the global score is 40% (Newman 2023a, 2023b). The trust in news outlets that the people themselves use is a bit higher at 41%, but it is still below the global score of 46% (ibid.). The declining rate of trust has been claimed to also result from a decrease in time and resources that reporters have to ensure the accuracy of information (Williams 2010, 223). Previously this lack of trust concerned mostly tabloids, but it has grown to a general distrust of news of all types (ibid.). News outlets in the United Kingdom have even been claimed to construct “ideologically motivated versions of reality” that strive to persuade people of the nature of certain phenomena (Baker et al. 2013, 3).

Trust toward news in India is higher than in the UK in both news overall (38%) and in news the person uses (45%) while both values are still slightly below the global numbers of 40% and 46% (Krishnan 2023, Newman 2023a). In India, the notion of a free press that is a watchdog for the government is highly valued and has existed since the independence movement against British rule (Rodrigues & Ranganathan 2016, 213). However, India fell to its worst recorded position in the Press Freedom Index in 2023, with claims of journalists’ threatened security and strong political influencing, which has resulted in government critical reporters facing aggression from online harassment to legal charges (Krishnan 2023). It has been claimed that reporters have to either censor

themselves or distribute the government's agenda (Soni 2017, 29). Other criticisms that the country's news has faced include claims of bad quality, closeness to political parties, biased reporting, and sensationalism (Rodrigues & Ranganathan 2016; 23, 24). Even though heavily criticised, the media field in India has had significant advantages from an expanding field of consumers due to a continuously growing population and increased levels of literacy and income in the country (ibid., 23). The growing number of consumers has somewhat shielded India's news field from changes that threaten, for example, the news field in the UK, where changes in audience behaviour and falling revenues create challenges (Newman 2023b).

In addition to the public opinion towards journalism, India's societal context strongly influences its news discourse. The country's uneven distribution of wealth, massive population, and the fact that journalists come mostly from the upper middle class influence the issues that get published (Rodrigues & Ranganathan 2016, 3; Soni 2017, 26). For example, a study found that only approximately 2% of news items in India's six most circulated news outlets covered issues of rural India which might be a result of journalists and audiences coming from urban backgrounds (Mudgal 2011). On the other hand, India's massive population might influence what topics are interesting or unique enough to make it to the news. Events that influence a small number of people in cities with a population of over ten million might not be enough to "make news" in the way they might in smaller countries (Rodrigues & Ranganathan 2016, 219-220).

These are all features that make the field of journalism in India different from the UK as the latter has a smaller population and more equal distribution of wealth, with more criticism posed on the political nature of news articles than unequal coverage of regions and class. However, there is a strong correlation in the UK between social class and news outlets read. Those with a higher income, education, and social status read "upmarket" outlets, while those with lesser read "middle-market" outlets and those with the least read tabloids (Williams 2010, 9). Thus, there might not be the same

problem of rural or lower-class news not getting reported as in India, as the reporting has instead fragmented to different outlets based on class.

To summarize, the contexts for creating news in both countries are different. The news field in the UK is seen as strongly tabloidized, ideologically loaded, and taking clear political stances toward topics, while it is trusted less than in India and below the global levels. India's news field is characterised by possibly threatened freedom of the press and reporting to and about a massive population, while having a higher rate of trust than the UK. These differences form the context for reporting news in the countries and influence the discourses in the nations. As a result, the discourses and representations created in each nation's news coverage can be expected to differ from one another. Due to a stronger political divide, the UK's news outlets might have bigger differences in their reporting, while India's unstable freedom of the press and political pressure might result in a more unified representation of topics as there is less room for the outlets' own agendas.

2.3 Journalism and Climate Change

As heatwaves are strongly connected to climate change, it is also relevant to characterise and describe the relationship between journalism and climate change. Major news organisations have been the second most used source of information concerning climate change globally (Robertson 2022). As one of the biggest sources of information, news outlets and journalists have a big responsibility in giving accurate and accessible information on the topic. This also means that they have a powerful role in determining how things are represented. When writing news articles about climate change, one needs to make scientific, specialist knowledge understandable and accessible to wider audiences, and therefore the reporting always involves representation (Bødker & Morris 2021, xiii). Because this information might otherwise be inaccessible to the public, the representations that journalistic discourse creates of climate change and its related phenomena become especially important.

However, reporting on climate change has also been called the biggest challenge that journalists have ever faced (Eide & Kunelius 2020a, 164). The basic idea of reporting and features of

news discourse do not make climate change the most suitable subject for news articles. News articles often refer to things that are happening at the moment, or are unexpected or urgent, instead of complex, long-term, and indeterminate phenomena such as climate change (Bødker & Morris 2021, xiii). This makes single climate disasters more suitable for reporting than the larger phenomenon behind them (ibid.). Focusing reporting on single climate disasters can become problematic as it is “too late” if attention is paid only when disasters have already struck (Robertson 2022), as actions to counter climate change should be taken to prevent these disasters and thus attention paid before the disasters happen.

In addition to climate change not fitting traditional characteristics of news, certain aspects of climate change make it harder to represent and report on. Especially its exceptional scale, from local to global and past to future, and its complexity, as it relates to almost all other fields of human behaviour, make climate change a phenomenon that is difficult to report (Kunelius et al. 2017, 2-3). Climate change also crosses political and jurisdictional borders, which makes questions such as who is allowed to make decisions and who is responsible harder to define (ibid.). This is further complicated by the fact that there are no impartial or objective entities to coordinate matters, as every nation and society is connected to the crisis, and thus has its own interests (ibid., 2).

As established, climate change is not easy to report about due to the traditions of journalism and the complex nature of the phenomenon, but difficulties also arise from the different desires of the audience. As was stated in Chapter 2.1.1, one key factor that influences what gets reported and how, are the wishes and wants of the audience. As objectivity is often a norm in journalism, climate change has been attempted to report of in a balanced manner, where climate scientists and climate sceptics have both been used as sources. This practice has been a common criticism of climate journalism (Strauss et al. 2022, 467), but significant differences of opinion have been surveyed between the Global North and Global South on the matter. Regions such as Latin America, Southern Europe, and Asia Pacific have been more accepting of news outlets favouring climate action, while northern

regions of Northern and Western Europe and North America have preferred impartial reporting of varied views (Robertson 2022). Globally, nearly half of the readers agree that news outlets are providing accurate information on climate change, but when looking at the ideological views of the public, almost half of respondents who did not see climate change as a serious problem think that the news media is doing a bad job in reporting it (Newman et al. 2020).

It has been suggested that framing the issue of climate change differently might attract engagement from a larger variety of people. For example, an environmental frame attracts people who think of themselves as environmentalists, while alienating those who do not care about environmental issues (Sarfaty & Maibach 2015; 258, 260). A health frame, for example, could resonate with a larger audience as nearly everyone is concerned about their health (ibid.). This demonstrates how framing the topic differently can attract new audiences and influence how the topic is understood.

Climate change has been characterised as a “wicked problem” due to its complex nature and possible lack of resolution (Ludwig 2001, 758), and, as established in this chapter, it is difficult to report through journalistic conventions, even though media is a key channel for information related to the topic. As the desires and wishes of the audience also guide what gets reported, the difference in desires for impartiality in climate change reporting between the Global North and Global South might create differences in reporting between the UK and India.

2.4 Representation of Heatwaves in Media

According to the World Meteorological Organisation (n.d.), a heatwave is a period of abnormally hot days and nights that can last from a few days to a few months. Heatwaves have become more frequent and intense since the 1950s as a result of human-induced climate change, and the same development will continue in the future with further global warming (World Meteorological Organisation, 2023).

Heatwaves have been claimed to be “the deadliest global weather hazard” (Met Office n.d. a) with varying effects based on age and socioeconomic factors, among others (World Meteorological

Organisation 2023). Heatwaves increase mortality, inflict illnesses, and amplify pre-existing diseases, while creating societal impacts like public health emergencies, power shortages, and loss of workforce (World Health Organisation n.d.). Heatwaves also increase the risk of other hazardous weather phenomena such as wildfires, drought, and air pollution (World Meteorological Organisation n.d.). The negative effects of heatwaves have strong geographical variation, as those with the least resources and capability for adaptation will be affected the most (ibid. 2023). According to predictions, one billion people will live in areas impacted by extreme heat stress if global warming is not countered (Met Office n.d. c).

All areas of the UK have been predicted to turn warmer during the 21st century with hotter summers becoming more common and heatwaves getting more intense, long, and frequent (Met Office n.d. c, Government UK 2023). In 2022, there were approximately 2,985 deaths associated with heatwaves in the UK (Government UK 2023). India has similar predictions of intensifying heat and more frequent heatwaves with more casualties (National Disaster Management Authority India n.d.) but reported only thirty heat-related deaths in 2022 (India Meteorological Department 2022). The reporting of heatwave-related deaths has been questioned in national and international media with claims of too few and too many deaths getting reported (Kapoor 2023, Pandey 2023, Dhillon 2023). As heatwaves in the UK and India are different and occur in different contexts, their representations are predicted to be different.

Because heatwaves cause adverse and dangerous effects while being predictable and often preventable (World Health Organisation n.d.), their representation and framing in news media are significant as they can impact how heatwaves and their risks are understood by society (O'Neill et al. 2023, 90). Previous studies of heatwave representation in media have focused on written data, visual data, and the attitudes of both readers and writers. In my bachelor's thesis, I studied the representations of heatwaves in news articles from the *Daily Mail* and *The Guardian* from the year 2020 (Heikkilä 2021). The study found that the verb, adjective, and noun attribute collocates of the

terms *heatwave* and *heatwaves* in the two news outlets were similar and mostly held neutral connotations (ibid.). However, the *Daily Mail* had several instances of positive connotations in the collocates, for example, *enjoy the heatwave* and *welcome the heatwave*, while *The Guardian* had none. In addition, semantic themes that held negative connotations appeared significantly more in *The Guardian*'s articles, which led to the conclusion that news outlets of different political leanings have different representations of heatwaves in the UK (ibid.).

A similar finding of positivity versus negativity was made in a study of climate news in *The Guardian* and the *Daily Mail* (Dahl & Fløttum 2017). The study found that the news value of positivity was present in 36% of the *Daily Mail*'s headlines and only 5% of *The Guardian*'s (ibid., 128). Negativity was found in the headlines of both news outlets but in a way that reflected “ideological differences”, as the *Daily Mail* had negativity present in stories emphasising “the ignorance of climate scientists” with calls to conspiracy, while *The Guardian* presented negativity in headlines of stories on climate change science, for example warnings of attempts to discredit climate science (ibid.).

In a corpus analytic study of UK articles covering hot and cold extreme weather, Tang (2022, 236) found that the temperature changes were framed as abnormal but not dangerous, with the emphasis on the speed, length, and suddenness of change in weather. In the same study, a focus group of readers concluded a connection between extreme temperatures and health impacts, but in the context of hot extreme weather, it was seen as overdramatic, even though the language used in the texts was alike the one used regarding cold extreme weather (ibid., 239). This emphasised the dissonance between the frame of the information reported and the readers' understanding of what is real (ibid.). Another study of heatwave reporting in Europe found that articles regarding heatwaves focused on their record-breaking nature, latest developments in the weather, the potential dangers created, impacts on humans and industries, and attempts to respond to the heatwave (Painter et al. 2021).

On the other hand, O'Neill et al. (2023, 95) found that in news articles about heatwaves in four European countries the text was rarely positively valenced, while nearly a third of the images in the articles had positive valence with the majority labelled as “leisurely activities in the sun”. This shows an inconsistency in reporting heatwaves, which might explain why the phenomenon is sometimes understood as not dangerous. Painter et al. (2021) also found that most images in the European news articles depicted “enjoyment”, while the texts did not. As news outlets can have such major differences in the representations that a single article creates, it is understandable that heatwaves are understood in varying ways, and thus could be framed through various news values.

As regards news values¹, a previous study on European journalists' opinions on reporting of heatwaves found that the values of Superlativeness, Negativity, and Proximity were seen as the most important values when reporting heatwaves (Strauss et al. 2022, 478), while previous studies of climate news articles in Australia and the UK have found the values of Negativity, Eliteness, Impact, and Superlativeness to be the most prominent in verbal data (Bednarek & Caple 2012, Dahl & Fløttum 2017). Examples of linguistic features that constructed the news values for the value of Negativity were references to emotion (*scary, devastating*) and negative vocabulary (*trapped*). For Eliteness, examples were references to powerful organisations (*IPCC, UN*), and for Impact, those were references to effects of the event (*will damage, washed away*). Superlativeness was constructed through references to strong emotions (*horrifying, petrified*) and numerals (*billions*).

The discourse of heatwave news has been more thoroughly studied in industrialised nations of the Global North. Thus, previous findings of representations of heatwaves in the Indian media are limited. In a study of Indian news reporting, Painter et al. (2020) found that 21% of articles covering a heatwave had mentions of climate change and nearly half of the analysed articles covering extreme weather events had quotes from politicians, non-governmental organisations' representatives, or other

¹ For definitions of the news values, see Table 1 in Chapter 2.2.1.

representatives. There were also some expressions of severity in the data (ibid.). When looking at the larger discourse of climate journalism in India, the dominant frames have been found to be those of uncertainty, implicit risk, threat, and politics (Jogesh & Painter 2013, 104; Billet 2010). These findings suggest that heatwaves have often not been connected to climate change and they have been reported with plenty of quotations of different influential figures. Climate journalism in general has focused on the possible impacts of the phenomenon, the threat it creates, and the political questions surrounding it.

As established in these chapters of the theoretical background, discourses influence how reality is understood, and journalism can be an especially strong influence through constantly framing events and phenomena from a certain perspective while reporting. The contexts of journalism and heatwaves in the two countries studied are different, and thus their created representations might also differ. In the UK, heatwaves have been represented as abnormal and having human and non-human impacts, while images in the news articles have focused on the enjoyment of heat. In India, news articles regarding heatwaves have had some mentions of climate change with quotes from authorities while larger frames of risk, threat, and uncertainty have emerged from the nation's climate journalism.

3 Material and Methods

In this section, the data and method of analysis for this thesis will be introduced. First, corpus analysis as a method in general and its relevant terms will be explained. Second, the chosen data will be outlined. Third, the steps taken in the analysis and the precise method of analysis will be described and the ethics of this thesis briefly covered.

3.1 Corpus Analysis

Corpus analysis is a method that is used to find linguistic patterns from large bodies of naturally occurring language and it can be used to understand how language constructs discourses (Baker 2006, 1). These sets of language data are called corpora, and they aim to be a representative sample of a specific language type (ibid., 2). For example, there are English corpora such as the Corpus of Contemporary American English (COCA), the British National Corpus (BNC), and the News on the Web (NOW) which are more general reference corpora. In addition to these more general corpora, a researcher can create a specialized corpus for analysing a precise variety or genre of language, for example, newspapers (ibid., 26) as was done for this thesis. This thesis uses specialized corpora as it provides the researcher with more relevant information regarding the set research questions. A specialised corpus lets the researcher choose more flexibly what kinds of texts to include, from what time period, and relating to what context (Gillings et al. 2023, 10), thus providing a smaller amount of more relevant data than a general corpus would.

The benefit of using corpus techniques with discourse analysis is the possibility of analysing larger amounts of data, reorganizing it easily for different ways of analysis, and helping restrict researcher bias, as a set of hundreds of articles, for example, leaves less room for selectivity and cognitive bias than looking at single articles does (Friginal & Hardy 2021, 116; Baker 2006, 12). Thus, corpus-based discourse analysis has been considered more objective than general discourse analysis that involves a close reading of a smaller set of language, which might leave more room for selectivity. However, there is a risk of doing the same “cherry-picking” when compiling a specialised

corpus, as the researcher can choose more freely which texts are selected than when using a general reference corpus, and thus choose material that only gives results they hope for (Gillings et al. 2023, 10). The researcher needs to be careful, acknowledge this risk, and compile their corpus in an unbiased way.

Several different features can be analysed from a corpus, of which this thesis focuses on collocates. Collocates refer to words that frequently appear next to each other and have also been called “the company a word keeps” (Baker 2006, 5-6; Baker & Ellice 2011, 17). This statistically significant co-occurrence of words as a phenomenon is called collocation and it helps to understand the meanings and associations that words have, as these meanings are created by the context that words occur in (Baker 2006; 5, 96). In other words, collocation gives words additional meanings that can show the author’s viewpoint, values of speech communities, and influence readers by creating associations (Gillings et al. 2023, 27-30). If the collocation has become strong, even one half of the collocating word pair can invoke someone to think of the other half (Baker 2006, 114). For example, *climate* and *change* appear frequently together, and thus the word *climate* has a strong likelihood to bring the combined term *climate change* to mind.

There are several ways of measuring collocational strength, of which this thesis relies on the MI Score as it tends to emphasise content words (Baker 2006, 102), which are the focus of this study. MI refers to mutual information which an algorithm calculates by comparing the expected likelihood of two words appearing close to each other to the amount they actually occur together in the corpus (ibid., 101). The difference between the expected amount and the actual amount is converted into a score that expresses the strength of the collocation, the MI score (ibid.).

The collocational meaning that arises from the interaction of a word and its collocates is called semantic prosody (McEnery et al. 2006, 84). Semantic prosody differs from connotation in being only collocational, meaning it arises from the relationship of two words, while connotation can be also non-collocational and a feature of a single word (ibid., 85), as in the example of *blue* given in Chapter

2.1. An example of semantic prosody is the words *personal* and *price* which on their own are quite neutral but when appearing together have a negative prosody as *personal price* often refers to unpleasant consequences (ibid., 83-84). This meaning that the context of surrounding collocates create for a node word can also become a feature of the word itself, as “a word frequently keeping ‘bad company’” can start to indicate something displeasing also when appearing alone (ibid., 84). This is why analysing the collocates of a word can reveal a lot about attitudes surrounding the topic.

In addition to collocates, this thesis uses concordance lines to help in analysis. Concordance lines are all the occurrences of a search term in a corpus presented in their linguistic environment, often a few words to each direction. (Baker 2006, 71). Looking at the context of the word helps with analysing collocates as they help determine what meaning of the word is used in a specific occurrence and it shows whether the two words actually appear together or are, for example, divided by punctuation.

Previous corpus-analytic studies of collocates in the discourse of news outlets have highlighted underlying attitudes toward different topics. For example, Baker et al. (2013) found that collocates of the terms *Muslims* and *Islam* indexed conflict with words relating to armed conflict (*guns, invasion, military*) and violence/damage (*attack, blast, bomb*), among others. Another study regarding discourses of refugees and asylum seekers in British media found that the most populated categories of collocates of *refugee, asylum seeker, immigrant, and migrant* were entry (*arrive, trying*), residence (*camp, shelter*), and provenance/destination/transit (*Iran, Pakistan, UK*) and the categories of representation were mostly negative (Gabrielatos & Baker 2008).

Corpus analysis is the chosen method for this thesis as it is very suitable for identifying continuous media repetitions around different themes that influence the readership (Baker et al. 2013, 26). A corpus approach together with more qualitative discourse analysis makes it possible to statistically test the data to determine whether consistent patterns exist (Friginal & Hardy 2021, 2). This study focuses specifically on collocates as they often demonstrate the unconscious associations

and prosody that words have and thus can show the assumptions and attitudes around a topic (Baker 2006, 114; Stubbs 1996, 172).

3.2 Material

The material of this thesis was gathered from the Nexis Uni database, and it consists of news articles from four different news outlets: two from India and two from the UK. Based on data from the Reuters Institute for the Study of Journalism, the most read news outlets for each country were identified and from these, the top ones representing each political leaning that were available in my database and in English were chosen. The chosen news outlets from the UK were *The Guardian* (left-wing) and the *Daily Mail* (right-wing), and from India *The Times of India* (right-centrist) and the *Hindustan Times* (left-centrist) (Pew Research Center 2018, Media Bias Fact Check 2023a & 2023b). All outlets were in the top five most used in the nation either online or offline (Newman 2023b, Krishnan 2023). It is important to note that this set of data could leave out major Indian news outlets that are written in other languages, for example Hindi, and thus conclusions from the data are limited to the English media scene of India.

From each news outlet, all articles from the beginning of May 2023 to the end of July 2023 that included at least one of the terms *heatwave*, *heat wave*, *heatwaves*, or *heat waves* were downloaded and compiled into respective corpora for each outlet. The four key terms will be referred to as nodes from now on. The summer of 2023 was chosen as the timeframe as it was the hottest year recorded on Earth and the second hottest year recorded in both the UK and India (O'Shea 2023, Met Office 2024, the Weather Channel 2024). The months May, June, and July were chosen as they include two months of heatwave season in each country and one month when heatwaves can occur (National Disaster Management Authority India n.d., McCarthy et al. 2019). A specific timeframe for the data was chosen to restrict bias and randomize the selection of articles.

After downloading the articles with the above-mentioned criteria from Nexis Uni, articles that did not consider heatwaves as a weather phenomenon were removed. For example, some articles

considered songs or movies named “Heatwave”, some only mentioned heat, and some referred to waves of heat, for example as a result of an explosion. In addition, duplicate articles were removed. All metatext, such as page headers, author names, and publication dates was removed as it was considered irrelevant for this study. The documents were converted from .docx files to plain text .txt files for analysis in the chosen software. This resulted in the following corpora: a 56,468-word corpus of 102 articles from the *Daily Mail*, a 560,930-word corpus of 318 articles from *The Guardian*, a 114,279-word corpus of 344 articles from *The Times of India*, and a 110,816-word corpus of 209 articles from the *Hindustan Times*.

All four news outlets publish news about climate change and the left-leaning outlets *The Guardian* and the *Hindustan Times* have sections on their web outlets dedicated to the topic. Of the four chosen news outlets, *The Guardian* has made the strongest stance on climate change and climate journalism. According to *The Guardian*’s head of environment, the outlet has pioneered in environmental reporting and given climate-related issues more attention and resources than any other media organisation (Hanman 2023). The outlet also publishes a yearly climate pledge, the latest of which promises reductions in emissions, refusal of advertising fossil fuel companies, and continued transparent quality reporting of environmental issues (The Guardian 2023). The *Daily Mail* has no similar statement and environmental concerns or the outlet’s stance toward climate change are not stated on their website or the website of the owner organisation, DMG Media. It only describes the *Daily Mail* as reflecting “the concerns, hopes, and lifestyle of this powerful audience” (DMG Media 2024). However, an analysis of UK news editorials has found that the stance of right-leaning news outlets, such as the *Daily Mail*, has shifted from opposing to more likely supportive of climate action since 2016 (Gabbatiss et al. 2022). The *Daily Mail* has previously been critiqued for climate change denial but the outlet’s attitude toward the topic has shifted to more supportive.

Similarly to the *Daily Mail*, neither the *Hindustan Times* nor *The Times of India* have stated their stance toward climate change or climate journalism. HT Media Group (2020b), the owner of

Hindustan Times, has labelled sustained growth as one of the organisation's values but does not list concrete goals for applying sustainability in their actions as *The Guardian* did. Times Internet (2019), which owns *The Times of India*, has only stated that *The Times of India* engages readers to "drive progress at a local and national level". Both outlets publish a significant amount of climate change-related articles, but since early 2019 the number of articles has been bigger in the *Hindustan Times* (Boykoff et al. 2024). This demonstrates a clear difference between the left-leaning and right-leaning outlets.

In addition to the four newspapers' differing political leanings, the newspapers are trusted to varying amounts. The UK's news outlets have a big gap in their amount of trust with the *Daily Mail* having 25% trust, while *The Guardian* has 51% (Newman 2023b). The Indian news outlets both have higher rates of trust with only a slight difference, as *The Times of India* has 69% trust, and the *Hindustan Times* has 67% (Krishnan 2023). This demonstrates the bigger differences and stronger polarisation of media in the UK as described in chapter 2.2.2. The two UK news outlets have even been described as the most left-wing and most right-wing news outlets in the country (Smith 2017). This gives reason to believe that the differences in representations and frames of heatwaves based on political leaning will be stronger in the UK outlets than those of India.

3.3 Method of Analysis

The method of analysis for this thesis is corpus-based discourse analysis. First, quantitative corpus analytic methods were used to determine the strongest collocates of the nodes examined. This was followed by qualitative analysis and interpretation of larger themes behind individual collocates. The analysis was conducted with the software AntConc version 3.5.8, and it focused on the content word collocates of the four nodes because content words tend to be more semantically loaded and give a better picture of what themes are present in the data (Gillings et al. 2023, 16). Each corpus was first analysed individually, followed by comparisons of political leanings inside the countries, and finally a comparison of the results of the two countries in total. The singular and plural form nodes were

analysed separately. The singular *heatwave* and *heat wave* are likely to refer to specific heatwaves while the plural forms *heatwaves* and *heat waves* will presumably refer to heatwaves in general and more as a phenomenon. Thus, it is justifiable to look at the forms differently, as single instances of heatwaves might be framed and represented differently than the phenomenon as a whole.

From each corpus, the strongest collocates of a three-word span to both the left and right of the node based on the MI score were determined. In this thesis, all collocates with a minimum MI score of 6 were considered relevant as it has been suggested that a minimum score of six is necessary for a word to prompt an association with another one (Durrant & Doherty 2010, qtd. in Gillings et al. 2023, 29). The concordance lines of the strongest collocates were analysed to ensure that the collocates actually refer to the node. Collocates that in all occurrences were divided from the node with a period, parenthesis, or colon were considered irrelevant in this study. An example instance of this would be “temperatures soar in a sizzling summer heatwave. Johannes Niessen, the head of the BVOeGD...”. In this example, *Johannes* is a collocate of *heatwave*, but their connection is loose as they appear in separate sentences.

The MI score often brings out collocates of low frequency, but this is not considered as a problem because less frequent collocates can together make a larger theme frequent. In planned texts such as news, writers might aim to prevent repetition by using synonyms and other alternatives to a word, which makes the general meaning more frequent than the individual words used (Baker 2006, 143). For example, “largeness” can be referred to with words like *big*, *huge*, *colossal*, etc. All these words refer to the same general meaning and can create the same representation, and thus reinforce a pattern even if the frequency of the individual words is low (Baker 2023, 86).

After determining the strongest collocates, they were grouped into semantic categories to identify what kinds of representations of the nodes exist. A category had to include at least three different word types and at least ten tokens in total to be considered significant. The categories were defined by analysing the collocates and their concordance lines together with consulting dictionaries

to bring out relevant connections. Some collocates were categorised into several categories because their different meanings were equally frequent in the corpus, as suggested by Baker (2023, 86). After determining the semantic categories that are present in the corpus, the distinct categories were tied to the news values introduced in Chapter 2.2.1 to see which news values are the most prevalent in this data. At least one third of the collocates in a category had to relate to a news value for it to be considered as relevant to the category. This limit was chosen because the relation of a couple of collocates, however frequent, would not indicate the relation of the entire category to a news value, only those few collocates.

This method of analysis undoubtedly overlooks some features. For example, the terms researched may be referred to in the data with determiners or pronouns, and thus some representations of heatwaves might not come up in the data as accessing them would require close reading of all texts, which is beyond the scope of this thesis. Additionally, the chosen span for collocates might create different results than another span would, which means that some patterns and representations could only be found within the span chosen for this thesis, while some might be left out. The emphasis on semantic categories analysed from the strongest collocates in each corpus also brings the focus to larger themes from less frequent collocates, which might bring different results than analysis of the strongest collocates alone. Thus, different results of analysis might bring up or emphasise different kinds of results. Corpus analysis as a method altogether focuses on decontextualised language: it does not include information about who wrote and read the text, in what circumstances, and what responses it created (Baker 2006, 18). It also leaves out other forms of communicating discourses such as pictures, text positions, and font sizes (*ibid.*, 17). Thus, by using corpus analysis as the method, the focus of this thesis is decontextualised and strictly verbal data, and the results found cannot be generalised to news discourse as a total but only to its verbal form.

The data for this thesis was gathered from an existing database of public articles in an ethically sound manner. The most significant ethical question in this thesis is the subjectivity of discourse

analysis. Defining or naming a discourse is subjective, and the researcher's subconscious can influence the act of defining and the analysis made, even if being as objective as possible has been the aim (Baker 2006; 4, 11). As a Western Caucasian researcher, my analysis is affected by my experiences especially when it focuses on a nation and culture which I do not belong to, such as India. This possible bias was recognized and acknowledged when conducting research, analysing the results, and drawing conclusions.

4 Results

This section covers the analysis and its results. Some conclusions are also made, but they are discussed further in Chapter 5. The sections for each news outlet first describe the semantic categories found in the strongest collocates of the nodes and then relate them to different news values to see what values are prevalent. Singular and plural nodes are covered in separate subchapters.

4.1 *The Guardian* Corpus

The Guardian corpus was the largest, consisting of 560,930 words, thus resulting in the highest number of collocates. All four node word forms were present in the corpus, with a clear emphasis on the spelling without a gap. Singular forms appeared in the data more than their respective plural forms, which might be a result of more coverage concerning specific heatwaves than the weather phenomenon in general. However, this difference was the smallest in this corpus. The frequency of each node word is shown in Table 2.

Table 2. Frequency of each node word in *The Guardian* corpus.

Node	Frequency
<i>heatwave</i>	591
<i>heat wave</i>	36
<i>heatwaves</i>	360
<i>heat waves</i>	14

4.1.1 Nodes *heatwave* and *heat wave*

There was a total of 199 collocate types for *heatwave* and *heat wave* fitting the criteria detailed in sections 3.2 and 3.3 with an MI Score above 6.0. These collocates were grouped into nine semantic categories. A semantic category had to have at least three different types of collocate words and at least ten tokens in total to be considered a category. The categories, number of collocate types and tokens in them, and their definitions are detailed in Table 3. The number of undetermined collocates

that did not relate to any of the established themes or were too few to be considered a category is also given in the table. Seven of the nine news values defined in Chapter 2.2.1 were present with these nodes. The defining characteristic that related collocates to a news value is detailed the first time that characteristic appears. Afterward, the characteristic relating a news value to a collocate is mentioned only if it deviates from the former ones. For example, all instances of the value of Timeliness related to the appearance of present tense verb collocates and it is mentioned only in regard to the first appearance.

Table 3. Semantic categories of the collocates of *heatwave* and *heat wave* based on MI Score in *The Guardian*.

Category	Types	Tokens	Definition
	Total 199	Total 593	
1. Nature of heatwave	21	162	Descriptions of the length or strength of a heatwave, the action of getting longer or stronger, or nouns of measure.
2. Evolution of a heatwave	31	129	References to the beginning of a heatwave, descriptions of a heatwave moving or of changes in temperature, and references to time.
3. Location references	20	80	Names of places or generic references to location.
4. Effects of a heatwave	34	51	Descriptions of a heatwave causing effects, mentions of effects it has caused, objects of the effects, and descriptions of surviving a heatwave.
5. Heat and fire	13	37	Words that are related to heat or fire.
6. Violence	14	36	Words that are related to violent acts or violent ways to behave.
7. Defining heatwaves	21	27	Related to defining and naming heatwaves, descriptions of researching heatwaves, prediction of heatwaves, and mentions of causes of heatwaves.
8. Danger and discomfort	10	23	Words related to or describing danger and discomfort.
9. People and organisations	8	12	Names of people, organisations, or references to other authorities.
Undetermined	27	36	Relating to none of the categories.

The three categories with the most collocate tokens were “Nature of heatwave”, “Evolution of a heatwave”, and “Location references”. The collocates in these categories, shown in Table 4 below, all focused on describing the heatwave itself: how long or intense it is, when and where it occurred, and how it is changing.

Table 4. Collocates in the categories “Nature of heatwave”, “Evolution of a heatwave”, and “Location references”.

Category (subcategory)	Types	Tokens	Collocates
1. Nature of heatwave	21	162	
Strength of heatwave	10	126	<i>(record-)breaking, unrelenting, intense, intensifies, worsening, supercharged, historic, record, notable, unprecedented</i>
Length of heatwave	11	36	<i>longest, prolonged, prolonging, persists, persisting, continues, lasting, enduring (ADJ), length, enters, duration</i>
2. Evolution of a heatwave	31	129	
Temporal references	4	77	<i>current, ongoing, during, amid</i>
A heatwave moving	15	28	<i>engulfs, engulfing, engulfed, encircle, sweep, sweeps, sweeping, enveloping, spreads, expands, expanding, stretching, stretched, stretches, overtaken</i>
Beginning of a heatwave	9	19	<i>emerge, arrives, began, befall, grips, gripping, gripped, develops, looms</i>
Changes in temperature	3	5	<i>propelled, tempered, pushed</i>
3. Location references	20	80	<i>Passeig (de Garcia), Balkans, Med, Gaza, Dublin, Asian, (La) Palma, Europe, Tokyo, Italian, Oregon, Switzerland, swathes, somewhere, cells, eastward, Mammoth (Mountain), ski (resort), marine, coasts</i>

Collocates grouped into the first category described the nature of a heatwave through references to its strength or length. The collocates were mostly neutral, strictly describing the phenomenon, with the exceptions of *worsening* and *unrelenting*, which were negative. Collocates relating to the strength of a heatwave often represented it as extraordinary. For example, *(record-)breaking*, *record*, *historic*, *notable*, and *unprecedented* all portrayed the current heatwave as more momentous than previous ones. In addition, the concordance lines revealed that *intense* was mostly used in a superlative form, thus also portraying the heatwaves as extraordinary. Similarly, extraordinariness arose from collocates referring to length when their concordance lines were looked at. Examples of the concordance lines of these collocates are given in Table 5.

Table 5. Example concordance lines of collocates denoting extraordinariness.

the hottest day of the longest and most intense	<i>heatwave</i>	to befall Greece since record-keeping
were warned to prepare for the most intense	<i>heatwave</i>	of the summer and also one of
one of the longest, if not the longest duration	<i>heatwave</i>	this area has ever seen
could see its longest ever	<i>heatwave</i>	
amid an unusually prolonged and intense	<i>heatwave</i>	
Record-breaking Texas	<i>heatwave</i>	enters third week

Focus on the exceptional nature of a heatwave indicates several news values. These are the values of Impact, as the collocates assess significance, Superlativeness, as they represent the high intensity of heatwaves, and Unexpectedness, because the collocates evaluate uniqueness. In addition, several verb collocates were in the present tense, which implies the value of Timeliness as the collocates referred to the present time. There were a couple of collocates considered negative, as mentioned earlier, but they were too few to denote the value of Negativity, as at least a third of collocate types in a category had to relate to a news value in order for the connection to be seen as relevant.

The collocates grouped into the second category of “Evolution of a heatwave” consisted of references to time, the start of a heatwave, and changes in temperature and location. Nearly all collocates related to heatwaves happening at the moment, with no references to previous heatwaves, demonstrating the characteristics of the journalistic discourse, as things happening currently or of unexpected nature are usually the focus of reporting. In addition to being timely, several of the collocates describing the start of a heatwave or a heatwave moving were followed by a reference to a location the heatwave had moved to, as demonstrated in Table 6. Most of the references were to locations in Europe.

Table 6. Example concordance lines of collocates appearing with a location reference.

Punishing	<i>heatwave</i>	grips Pacific north-west as wildfires rage in
continues across Europe as further	<i>heatwave</i>	looms
The	<i>heatwave</i>	engulfing Greece is expected to be the longest
	<i>Heatwave</i>	blazes encircle Med from Algeria to France
in a year, with 27 days, as a	<i>heatwave</i>	sweeps through the Chinese capital, Reuters reports
authorities have said, as a	<i>heatwave</i>	spreads across north Africa and southern Europe

If a location is close to the reporter and their audience, it indicates the value of Proximity as an example of geographical or cultural nearness. However, references to locations that are further away, in this case outside the UK and perhaps Europe altogether, are harder to analyse for the Proximity value. Cultural nearness could explain reporting of other Western nations or locally popular travel destinations, but more general references, such as *north Africa*, are harder to relate to Proximity. Perhaps climate change and its related consequences are considered a global phenomenon, and thus heatwaves in further locations are seen as valuable to report on as they are a consequence of global actions and can cause further global consequences that are locally relevant. However, this is hard to make certain. Thus, only references to locations that are clearly geographically or culturally near are considered to represent the value of Proximity. In addition to Proximity, the focus on current events connects this category to the news value of Timeliness.

Collocates relating to location references, shown in Table 4, included both names of places and more general references to locations. Most of these referred to places in the Western world, and thus relate to the news value of Proximity with the exceptions of *Gaza*, *Asian*, *Tokyo*, *swathes*, and *somewhere*. None of the references seemed to be especially novel, and thus they are not seen to represent the value of Eliteness. When looking at the concordance lines, there were references to the impacts of a heatwave and personal experiences, but they were quite scarce and did not fill the required amount to represent a news value. Example concordance lines are given in Figure 1.

Extreme weather continues across Europe as further heatwave looms Hailstorms have hit northern Weather tracker: temperatures to intensify in Europe as new heatwave hits In contrast to the the average for the last 16 years. The deadly heatwave baking Europe, stoked by carbon pollution, has made out of their homes on La Palma as heatwave grips Europe More than 4,000 people have been evacuated outside all day in the 40 C (104F) heat. Europe heatwave fails to deter holidaymakers as easyJet demand mand for travel, according to easyJet. Related: Europe heatwave fails to deter holidaymakers as easyJet demand continent. Click the link below to read more: Europe heatwave: what should you do about travel plans her at the Union of Concerned Scientists. Europe heatwave: what should you do about travel plans ebb, but forecasters have warned of a fourth heatwave hitting southern Europe next week, with temperatures of

Figure 1. Example concordance lines of the collocate *Europe*.

Collocates grouped into the fourth category, “Effects of a heatwave”, included descriptions of a heatwave causing effects, what kinds of effects it caused, what the objects of these effects were, and what it is like to survive a heatwave. The collocates are displayed in Table 7.

Table 7. Collocates in the category “Effects of a heatwave”.

Category (Subcategory)	Types	Tokens	Collocates
4. Effects of a heatwave	34	51	
Heatwave causing effects	18	33	<i>affecting, blamed, (heatwave-)induced, deterred, deter, roiling, hallmarks, fails, amounted, prompts, quantities, proving, posed, piles, attracted, attributed, disrupted, placed</i>
Effects heatwave has caused	5	6	<i>torpor, dizzy, sweatiness, spells, protesters</i>
Surviving a heatwave	5	6	<i>grapple, endures, enduring (VERB), (heatwave-)friendly, withstand</i>
Objects of effects	6	6	<i>swarms, strikers, prisoners, harvest, flowering, jellyfish</i>

Negativity arose from these collocates, especially the ones describing the effects the heatwave has caused, as they all referred to negative effects. Similarly, the collocates describing a heatwave causing effects had some mentions of negative effects, such as the number of deaths or width of fires caused, as displayed in Table 8. The collocates related to surviving a heatwave also had a negative semantic prosody as they described getting through something negative even though it is difficult. For example, when looking up *endure** in the British National Corpus, the five strongest collocates are *hardships, hardship, sorrow, ordeal, and miserable*, demonstrating its negative prosody. There were also more general references to a heatwave simply causing something. In addition, some

collocates referred to a heatwave not being able to do something, mostly in relation to vacationers not changing their plans due to heatwaves.

All the collocates in this category represent the value of Impact, as they are all representations of the consequences of a heatwave. The value of Timeliness is also present. In addition, the value of Negativity is prominent as several collocates describe negative effects or hold negative prosody. The objects of a heatwave's effects were mostly non-human or referred to entire nations and thus the value of Personalisation is not seen as a part of this category even though there were a few mentions of specific groups of people being affected.

Table 8. Example concordances of the category "Effects of a heatwave" denoting Negativity.

15-day period of	<i>heatwave</i>	-induced infernos, the scale of the destruction is
The	<i>heatwave</i>	has posed a health risk to millions of
Europe	<i>heatwave</i>	fails to deter holidaymakers as EasyJet demands boom
Texas	<i>heatwave</i>	blamed for 13 deaths as scorching temperatures
endures a blistering	<i>heatwave</i>	, many countries are deluged
able to withstand the latest	<i>heat wave</i>	

Collocates in the semantic categories five, six, and eight, displayed in Table 9, were similar in nature. They were related to heat, fire, violence, danger, and discomfort. All the collocates represented a heatwave as being harmful and creating harmful consequences. While there are no superlative forms or intensifiers in these categories, all the collocates described the high intensity of the heatwave.

These categories are also similar in the fact that the collocates in them could have been put into other categories. Many of them either described the nature of a heatwave or a heatwave causing effects, which were pre-existing categories. However, the themes of heat, violence, and danger these collocates created might have been overlooked if the collocates had been put into other categories and not grouped based on these characteristics. By creating these distinct categories, the

representations of threat and fiery intensity are easier to demonstrate, and therefore, the collocates were not put into other pre-existing categories.

Table 9. Collocates in the categories “Heat and fire”, “Violence”, and “Danger and discomfort”.

Category Subcategory	Types	Tokens	Collocates
5. Heat and fire	13	37	<i>inflamed, infernos, sizzling, scorched, scorching, searing, stoked, dries, baked, blistering, sweltering, swelters, baking</i>
6. Violence	14	35	<i>suffocated, punishing, battles, brutal, deadly, hits, smacking, beats, fierce, ferocious, blasting, hitting, fallout, pummelling</i>
8. Danger and discomfort	10	23	
Danger	3	14	<i>threatens, dangerous, escape</i>
Discomfort	7	9	<i>toil, expose, sticky, oppressive, strains, bearing, hellish</i>

Most of the collocates in the category of “Heat and fire” described a heatwave as either burning or heating something, or the high temperature of the heatwave. All the collocates referred to a very intense type of heat as, for example, terms like *warm* or *sunny* did not appear. Instead, the amount of heat was represented as insufferable or harmful. For example, *sizzling*, *blistering*, and *searing* relate to a dangerous level of heat that can cause negative consequences to people. In addition, collocates such as *scorched*, *baked*, and *dries* described the impacts of a heatwave. The object of these impacts was nearly always a nation in the Western world. These features connect this category to the news values of Impact, Negativity, Superlativeness, Timeliness, and Proximity, as the focus of the collocates was on negative impacts of intense heatwaves with several verb collocates in the present tense and references to locations.

Collocates related to violence did not directly include mentions of negative consequences, except for *fallout*, but they described the actions of a heatwave in terms that are usually associated with negative and dangerous impacts. There were both references to the nature of the heatwave as dangerous (*punishing, brutal, deadly, fierce, ferocious*) and descriptions of the heatwave doing something violent (*suffocate, battles, hits, smacking, beats, blasting, hitting, pummelling*), similar to collocates relating to heat and fire. In addition, the object of the violence was often a location. These

features relate this category to the same news values as “Heat and fire”. These are Impact, Negativity, Superlativeness, Timeliness, and Proximity.

Collocates in the eighth category describing danger and discomfort were similar to those relating to violence, as they described heatwaves as something intense and causing negative consequences. A heatwave *threatens* and is *dangerous* and *oppressive*, while its existence is described as making work *toil* and locations *sticky*. Thus, these collocates relate this category to the values of Impact and Negativity in addition to Superlativeness and Timeliness.

The final two categories of collocates were “Defining heatwaves” and “People and organisations”. The collocates in these categories are presented in Table 10. Collocates in the seventh category related to defining heatwaves as a phenomenon from their cause, definition, and naming, to researching and predicting them. Most of the collocates did not seem to relate to any news value. There were some present tense verbs and temporal references in the concordance lines, referring to the value of Timeliness. There were also quotations from scientists in the collocates related to researching heatwaves, which could imply Eliteness due to references to elite role labels, but the number of collocates was not enough to denote a connection of the value to the whole category. Thus, Timeliness is the only news value relating to this category.

Table 10. Collocates in the categories “Defining heatwaves” and “People and organisations”.

Category Subcategory	Types	Tokens	Collocates
7. Defining heatwaves	21	27	
Defining and naming heatwaves	10	10	<i>defined, declaring, naming, classed, criteria, defines, dubbed, scored, refers, canicule</i>
Researching heatwaves	6	9	<i>researched, undeniable, (well-)documented, confidently, climatic, weathercasts</i>
Predictions of a heatwave	2	6	<i>anticipating, weathercasts</i>
Causes of a heatwave	3	3	<i>accountable, (climate-crisis-)fuelled, fueling</i>
9. People and organisations	8	12	
Names of people	4	5	<i>Bev, LoVecchio, Guy, Walton</i>
Names of organisations	3	5	<i>Chevron, Tribune, ESO</i>
Other authorities	1	2	<i>cabinet</i>

The ninth and final category of “People and organisations” consisted of collocates relating to names of people and organisations, and other references to authority figures. This category indicates the news value of Eliteness, as the collocates referred to people of fame or authority, and thus of elite status. *Bev* referred to Bev Turner, an English TV and radio presenter, *LoVecchio* referred to Frank LoVecchio, a doctor and academic, while *Guy* and *Walton* referred to Guy Walton, a former Weather Channel meteorologist. Due to their culture- or knowledge-based status, they are considered elite enough to be quoted concerning the subject of heatwaves, and thus seen to represent the value of Eliteness. Similarly, *cabinet* referred to the cabinet of Egypt, another figure of authority and status. The names of organisations worked similarly as they referred to statements from other elite figures, *Tribune* as the newspaper Texas Tribune and *ESO* as the British national electricity system operator. However, *Chevron* was an exception to this. The collocate did refer to the oil company Chevron, but it was used as a name for a heatwave and thus not considered elite.

To summarize, nine semantic categories were found in the strongest collocates surrounding the terms *heatwave* and *heat wave* in *The Guardian*'s corpus. These categories related mostly to the news values of Impact, Negativity, Proximity, Superlativeness, and Timeliness, which appeared in at least four of the nine categories. The values of Unexpectedness and Eliteness were also found in one category each, but they were not as dominant as the former values.

4.1.2 Nodes *heatwaves* and *heat waves*

A total of 187 collocate types were found for analysis with the nodes *heatwaves* and *heat waves*, which were grouped into nine semantic categories. All the categories were found with the singular nodes' collocates as well, except for “Other phenomena”. Additionally, collocates referring to people and organisations, which were present in the collocates of the singular nodes, were not found with these plural ones. Due to the collocates being largely similar, the news values relating to them were also quite the same. To highlight the differences between the collocates of the node words, similarities

are discussed only briefly. The categories, number of tokens and types, and their definitions are given in Table 11.

Table 11. Semantic groups of the collocates of *heatwaves* and *heat waves* based on MI Score in *The Guardian*.

Category	Types Total 187	Tokens Total 541	Definition
1. Other phenomena	19	121	Mentions to other phenomena either relating to weather or global issues.
2. Nature of heatwaves	19	97	Descriptions of the length or strength of heatwaves, the action of getting longer or stronger, or nouns of measure.
3. Evolution of heatwaves	26	57	References to the beginning of heatwaves and the number of heatwaves, descriptions of heatwaves moving, descriptions of changes in temperature, and references to time.
4. Location references	12	51	Names of places or generic references to location.
5. Defining heatwaves	27	48	Related to defining and naming heatwaves, descriptions of researching heatwaves, prediction of heatwaves, and mentions of causes of heatwaves.
6. Violence	18	41	Words that are related to violent acts or violent ways to behave.
7. Heat and fire	10	31	Words that are related to heat or fire.
8. Danger and discomfort	11	28	Words related to or describing danger and discomfort.
9. Effects of heatwaves	19	25	Descriptions of heatwaves causing effects, mentions of effects caused, objects of the effects, and descriptions of surviving heatwaves.
Undetermined	26	42	Relating to none of the categories.

The largest category of collocates related to mentions of other phenomena, either weather-related or otherwise of large scope. This was the only semantic category that was not found in the singular nodes' collocates as well. The collocates relating to this category are presented in Table 12.

Table 12. Collocates in the category "Other phenomena".

Category Subcategory	Types	Tokens	Collocates
1. Other phenomena	19	121	
Other weather phenomena	10	102	<i>bushfires, droughts, drought, hurricanes, floods, downpour, storms, wildfires, tornadoes, snow</i>
Other global phenomena	9	19	<i>extinctions, starvation, famine, crop, failure, failures, landslides, coral, bleaching</i>

All of these collocates appeared in lists of several phenomena, of which heatwaves were one. Examples are given in Figure 2. Presumably, these phenomena were seen as similar in either scope or impact. No clear news value is related to this category, as the phenomena are referred to quite generally and the different phenomena were not presented as impacts of each other, and their impacts were not discussed. The only news value that might relate to this category is Negativity. Some of the phenomena are themselves negative, such as *extinctions*, *starvation*, *famine*, *crop*, and *failure*, and others can be considered to create danger either to humans or non-human property, and thus be negative.

t without its challenges. In recent years, record **heatwaves and drought** crippled hydropower stations, resulting in power
 Ni\F1o. It raises the risk of **heatwaves, drought, and bushfires** in the east of the
 stop systems collapse , mass extinctions , fatal **heatwaves , drought and famine** , water shortages and flooded cities.
 consumers, 24 July). How fortunate that floods, **drought, fires and heatwaves** come free of hassle or
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 hot and dry conditions increase the risk of **drought, heatwaves and bushfires**. The Great Barrier Reef would
 \xF1o weather event, which lifts risk of **drought, heatwaves and bushfires**. block-time updated-timeUpdated at
 1o weather event, which increases the risk of **drought, heatwaves and bushfires**. A weather bureau update on
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 Ni\F1o events increase the risk of **drought, heatwaves, bushfires and coral bleaching**.
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 Ni\F1o events increase the risk of **drought, heatwaves, bushfires and coral bleaching**. You can read
 give the world a chance of avoiding catastrophic **heatwaves, wildfires, drought and** other climate calamities. The new

Figure 2. Concordance lines of the collocate *drought*.

Collocates in the categories from two to four all referred to the same news values as the collocates similarly categorised with the singular nodes. In addition, category five was mostly the same. The collocates in these categories are shown in Table 13 below. The repeated news values relating to these collocates are Impact, Superlativeness, Unexpectedness, Proximity, and Timeliness. The first three values relate to the collocates of the second category, “Nature of heatwaves”, as the collocates related to the extraordinary nature of the heatwave with collocates such as *impressive*, *worst*, *extreme*, and *(record-)breaking*. The value of Proximity appears with collocates relating to the

categories “Evolution of heatwaves” and “Location references”, as collocates in the former described the beginning, movements, or number of heatwaves with references to locations, and the latter consisted of location references altogether. Most of the locations were proximate, but there were also more general references, such as *continents*, *globe*, *seas*, *marine*, and *location*, which are too broad to be considered proximate. More general references or larger locations are not surprising as the collocates refer to the location of several heatwaves and not just a single one as the singular nodes did. Lastly, the value of Timeliness is denoted through the use of present tense in the verb collocates of the categories two, three, and five.

Table 13. Collocates in the categories “Nature of heatwaves”, “Evolution of heatwaves”, and “Location references”.

Category Subcategory	Types	Tokens	Collocates
2. Nature of heatwaves	19	97	
Strength of heatwaves	15	70	<i>supercharging, supercharged, worsening, severity, impressive, intensifying, intense, intensify, unrelenting, stronger, grown, worst, extreme, relentless, (record-) breaking, unprecedented</i>
Length of heatwaves	3	21	<i>longer, prolonged, continuing</i>
3. Evolution of heatwaves	26	57	
Temporal references	4	19	<i>seasonal, amid, recent, begun</i>
Heatwaves moving	7	15	<i>overtake, engulfed, sweep, sweeping, swept, spreading, spread occurrence, gripping, grips, gripped, grip, combine, emerge, triggered, trigger, upcoming</i>
Beginning of heatwaves	10	13	
Number of heatwaves	4	9	<i>successive, simultaneous, frequent, repeated</i>
Changes in temperature	1	1	<i>soar</i>
4. Location references	12	51	<i>Siberia, Puerto, Rico, Europe, Asia, continents, globe, Southwest, Northeast, seas, marine, location</i>
5. Defining heatwaves	27	48	
Defining and naming heatwaves	11	20	<i>rebadging, naming, named, criteria, names, ranking, phenomena, frequency, definition, tend, christened</i>
Researching heatwaves	8	14	<i>undeniably, influenced, connected, contribute, driven, (fossil-)fueled, reflecting, directly</i>
Predictions of heatwaves	4	7	<i>anticipation, forecasting, increasingly, inevitable</i>
Causes of heatwaves	4	7	<i>studying, meteorologist, link, unleashing</i>

In addition to the news values shared by all node forms, the value of Eliteness is referred to by collocates in category five, “Defining heatwaves”. Several of the collocates were quotations of elite figures, such as scientists, media, and tv-hosts, thus denoting the forementioned value. Examples are given in Table 14.

Table 14. Example concordance lines showing Eliteness in collocates of category five.

would be great if the media started naming	<i>heatwaves</i>	, although I’d expect them to
Walton has devised his own criteria for named	<i>heatwaves</i>	in the US, based on
television stations are not reporting that	<i>heatwaves</i>	are connected to climate change
Scientists are studying the	<i>heatwaves</i>	scorching the northern hemisphere for
meteorologist names US	<i>heatwaves</i>	after oil and gas giants
the University of Melbourne, says	<i>heatwaves</i>	are influenced by large-scale climate

The collocates in the categories six to eight of “Violence”, “Heat and fire”, and “Danger and discomfort”, shown in Table 15, focused on describing the high intensity of the heatwaves (*deadly, searing, monstrous*), and described the negative way they were causing effects (*suffocate, scorched, crippled*). These collocates relate to the same news values as the singular nodes’ collocates grouped into the same categories. These values are Negativity, Impact, Superlativeness, and Timeliness, to which all of these categories relate to. In addition, Proximity is found in the concordance lines of collocates relating to heat and fire. Unlike the collocates of the singular nodes, these collocates relating to violence do not denote Proximity.

Table 15. Collocates in the categories “Violence”, “Heat and fire”, “Danger and suffering”, and “Effects of heatwaves”.

Category Subcategory	Types	Tokens	Collocates
6. Violence	18	41	<i>strafe, rampant, suffocate, lash, collides, wreaking, ripping, deadly, plague, brutal, suffers, struck, punishing, fierce, killer, devastated, kill, die</i>
7. Heat and fire	10	31	<i>sizzled, frying, broiling, blistering, scorching, scorched, searing, baking, swelter, hotter</i>
8. Danger and suffering	11	28	

Related to danger	4	18	<i>threaten, warn, risk, monstrous</i>
Related to suffering	7	10	<i>distort, crippled, ordeal, oppressive, chaos, terrible, catastrophic</i>
9. Effects of heatwaves	19	25	
Heatwave causing effects	7	11	<i>roiled, roil, roiling, mounting, increasing, bigger, rippled</i>
Effects heatwaves have caused	5	6	<i>metabolic, pollute, mortality, costly, busy</i>
Objects of effects	4	4	<i>streetcars, pedestrians, paramedics, waterways</i>
Surviving heatwaves	3	4	<i>avoiding, resilient, cope</i>

The final category was “Effects of heatwaves”, with collocates related to describing heatwaves causing effects, the effects caused, objects of these effects, and surviving heatwaves, which all relate to the value of Impact, as they all focused on causing or caused effects. Additionally, the values of Negativity and Timeliness appear with the collocates, similar to the collocates of the singular nodes. The collocates themselves were not perhaps negative, besides *mortality*, but they related to undesirable impacts. As with the singular nodes, there was no personalisation of the heatwaves’ impacts present with these collocates, as there were only two collocates referring to humans and even they referred to quite large and faceless groups.

Overall, there were nine semantic categories found from the strongest collocates of nodes *heatwaves* and *heat waves* in *The Guardian’s* corpus. The collocates and news values were similar to those found in the analysis of the collocates of the singular nodes, demonstrating that the differences between reporting of single heatwaves versus them as a phenomenon were quite small. The biggest difference was that collocates relating to other large-scale phenomena appeared in the plural nodes’ collocates. This indicates that single instances of heatwaves were not as strongly contrasted against other phenomena. The news values relating the strongest to the categories and collocates were Negativity, Impact, Superlativeness, and Timeliness, which all related to at least four of the nine categories. There was also one category relating to Unexpectedness and Eliteness each, and three categories relating to Proximity, but these three values were less prominent.

4.2 The *Daily Mail* Corpus

The *Daily Mail* corpus was the smallest and consisted of 56,468 words. All four node word forms were present, even if minimally. The singular form *heatwave* was clearly the most frequent, as in *The Guardian*'s corpus, but the difference between the singular and plural forms was bigger, perhaps demonstrating that the *Daily Mail* reports even more strongly about specific heatwaves than about the phenomena in general. The frequency of each node is presented in Table 16.

Table 16. Frequency of each node word in *The Guardian* corpus.

Node	Frequency
<i>heatwave</i>	124
<i>heat wave</i>	3
<i>heatwaves</i>	39
<i>heat waves</i>	1

4.2.1 Nodes *heatwave* and *heat wave*

For the nodes *heatwave* and *heat wave*, 107 collocate types were found with an MI score above 6.0 and no division by punctuation from the node as detailed in Chapter 3.3. These collocates were grouped into seven semantic categories. The categories, number of collocate types and tokens, and the categories' definitions are detailed in Table 17 below based on the number of tokens in each category.

Table 17. Semantic groups of the collocates of *heatwave* and *heat wave* based on MI Score in the *Daily Mail*.

Category	Types	Tokens	Definition
	Total 107	Total 181	
1. Location references	15	36	Names of places or generic references to location.
2. Evolution of heatwave	15	32	References to the beginning of a heatwave, descriptions of a heatwave moving, descriptions of changes in temperature, and references to time.
3. Defining heatwaves	18	25	Related to defining and naming heatwaves, prediction of heatwaves, and commenting heatwaves.

4. Effects of heatwave	17	24	Descriptions of a heatwave causing effects, mentions of effects it has caused, objects of the effects, and descriptions of surviving a heatwave.
5. Danger and discomfort	8	13	Words related to or describing danger and discomfort.
6. Mythology and religion	5	12	Words relating to religious or mythological creatures and objects.
7. Violence	7	10	Words that are related to violent acts or violent ways to behave.
Undetermined	22	28	Relating to none of the categories.

Compared to the semantic categories found in *The Guardian*'s corpus, one new category, "Mythology and religion", and one new subcategory of collocates related to commenting heatwaves inside "Defining heatwaves", were found in the analysis. Several types of collocates found from *The Guardian* corpus were also not present with these nodes. These related to the nature of a heatwave, heat, fire, and names of people and organisations. In addition, collocates describing researching heatwaves and causes of heatwave, related to the category "Defining heatwaves", were not present in the strongest collocates of these nodes. Otherwise, the collocates of these nodes and the news values relating to them were quite similar to the ones in *The Guardian*.

The largest number of collocates related to location references, both location names and more general references. A clear difference compared to the previous corpus was that all location references were about the Western world or very general, such as *continent*, *outdoors*, and *marine*. In *The Guardian* corpus, references were made to places all around the world. As a result, all of the collocates here are relate to the news value of Proximity. The collocates in this category are shown in Table 18.

Table 18. Collocates in the categories "Location references", "Evolution of a heatwave", "Defining heatwaves", and "Effects of a heatwave".

Category Subcategory	Types	Tokens	Collocates
1. Location references	15	36	<i>Castille, Glasgow, American, Dublin, European, Europe, Canada, epicentre, resort, destinations, continent, outdoors, whatever, towards, marine</i>
2. Evolution of a heatwave	15	32	
Temporal references	7	22	<i>recent, upon, during, currently, amid, August, spring</i>

Beginning of a heatwave	4	5	<i>grip, heads, heading, phase</i>
Changes in temperature	3	4	<i>soar, chilly, gets</i>
A heatwave moving	1	1	<i>engulfing</i>
3. Defining heatwaves	18	25	
Defining and naming heatwaves	9	16	<i>threshold, officially, reference, ruled, named, declared, dubbed, name, suggested</i>
Commenting heatwaves	5	5	<i>comment, words, suggesting, sensationalise, hyperbolised</i>
Predictions of a heatwave	4	4	<i>predicting, anticipate, forecasts, possibility</i>
4. Effects of a heatwave	16	23	
Heatwave causing effects	10	16	<i>implications, gripe, exacerbated, affecting, (heatwave-) induced, spread, common, brought, matters, causing</i>
Surviving a heatwave	4	5	<i>coping, (heatwave-)proof, experiencing, haven</i>
Effects heatwave has caused	1	1	<i>shuts</i>
Objects of effects	1	1	<i>traffickers</i>

Collocates grouped into the second, third, and fourth categories were quite similar to the ones appearing in *The Guardian* corpus. The second category, “Evolution of a heatwave”, consisted of collocates focused on temporal references, describing changes in temperature, and the beginning and movements of a heatwave. All the verb collocates were in the present tense and the temporal references related to the current time, apart from *August* and *spring*, connecting the collocates in this category to the news value of Timeliness. Unlike in *The Guardian* corpus, the collocates in this category does not relate to Proximity as the focus was more on the currentness of the heatwave than on evolution of its location.

The third largest category of collocates was “Defining heatwaves”, which consisted of slightly different collocates than the same category in the previous corpus. *The Guardian* corpus had strong collocates describing researching heatwaves and defining their causes, which the *Daily Mail* did not have. Instead, there were collocates describing someone talking about heatwaves, labelled as a subcategory “Commenting heatwaves” in Table 18. These collocates referred to celebrities, while the collocates related to definitions and naming of heatwaves referred to experts and meteorologists,

showing a clear difference in the terminology used in quotations of different figures. The collocate *comment* referred to Alison Goldfrapp, a British artist, and all the collocates *words*, *suggesting* and *hyperbolised* referred to Antonio Sano, who was described in the article as “self-schooled weather-forecasting hack ... with his charisma and eye for publicity”. The only exception was in the concordance of *sensationalise*, referring to the brother of a person who died in a heatwave, which relates more to personalisation than quoting someone elite.

In addition to referring to celebrities, the collocates were more evaluative than those related to quoting scientists or experts. Especially *sensationalise*, *suggesting*, and *hyperbolised* evaluate the nature of making the comment somewhat critically. Example concordances of these collocates are given in Table 19 below. Even though these differences existed, the news values relating to this category are the same as in *The Guardian*’s corpus. These values were Timeliness and Eliteness, the latter relating to references to elite figures, such as experts, meteorologists, and celebrities in the concordance lines of several collocates.

Table 19. Example concordance lines of collocates relating to the value of Eliteness in the category “Defining heatwaves”.

Following last year’s	<i>heatwave</i>	, experts suggested that kind of
weather forecasters are now predicting that another	<i>heatwave</i>	- named Charon, after Hades’
written during last summer’s	<i>heatwave</i>	is a comment on climate change
he has hyperbolised the	<i>heatwave</i>	using words suggesting the world is
Stefano, puts it, by those seeking to sensationalise the	<i>heatwave</i>	’s impact

Collocates grouped into the fourth category, “Effects of a heatwave”, were similar to those in *The Guardian* as they related to describing a heatwave causing effects, the effects caused, object of these effects, and descriptions of what it is like to survive during a heatwave. All these collocates relate to the value of Impact as they all pertained to effects caused by a heatwave. The value of Timeliness is also present. In addition to these two values, there were some collocates that were either themselves negative, such as *gripe*, *exacerbated*, and *coping*, or referring to negative consequences

in their larger context. However, the amount was not enough to denote the value of Negativity in relation to the whole category. This creates another difference between the strongest collocates of the *Daily Mail* and *The Guardian*, as in the latter, the value of Negativity was present with collocates related to effects of a heatwave.

Collocates related to the fifth category, “Danger and discomfort”, and the seventh category, “Violence”, denote the values of Negativity, Impact, and Superlativeness similarly to the collocates in these same categories in *The Guardian* corpus. The collocates in both categories, displayed in Table 20, focused on describing the intense nature of a heatwave (*severe, unbearable, fierce*) and a negative way in which it is causing effects (*threatens, batters, killed*). In addition, collocates in both categories relate to the value of Timeliness.

Table 20. Collocates in the categories “Danger and discomfort”, “Mythology and religion”, and “Violence”.

Category Subcategory	Types	Tokens	Collocates
5. Danger and Discomfort	8	13	
Related to discomfort	3	7	<i>severe, suffers, suffering</i>
Related to danger	6	6	<i>worries, worry, exploit, unbearable, threatens, catastrophic</i>
6. Mythology and religion	5	12	<i>grail, Cerebrus, Lucifer, Charon, Cerberus</i>
7. Violence	7	10	<i>battling, batters, fierce, rage, deadly, killed, devastating</i>

Collocates grouped into the sixth category, and the last one analysed, related to mythology and religion. This was a category not present in the corpus of *The Guardian*. These collocates referred to figures from Christianity (*grail, Lucifer*) and Greek Mythology (*Cerebrus, Charon, Cerberus*). All except *grail* relate to the land of the dead, either hell or the underworld. *Cerberus* and *Cerebrus* (likely a misspelling of the former word) refer to the creature guarding the gates to the underworld, *Charon* is the ferryman of the dead, and *Lucifer* is a name for Satan in Christianity (The University of Melbourne n.d. a & b, Britannica n.d. b). All of these collocates were names for heatwaves, as demonstrated in Table 21. Because they are associated with the underworld and death, they are seen

to relate to the news value of Negativity. The only exception is the collocate *grail*, referring to the holy grail which is a holy object in Christian mythology (Britannica n.d. a), as it relates to something being of value in a heatwave, and thus does not relate to any news value.

Table 21. Example concordances in the category “Mythology and religion”.

Another	<i>heatwave</i>	, called Charon , after the mythical ferryman
and plans to christen the continent’s next	<i>heatwave</i>	Lucifer
has been engulfed by a severe	<i>heatwave</i>	named Cerberus after the hound of Hades
	<i>Heatwave</i>	Cerebrus , named after a mythological
Holey grail of the	<i>heatwave</i>	? crochet!

To conclude, seven semantic categories were found from the strongest collocates surrounding the terms *heatwave* and *heat wave* in the *Daily Mail*’s corpus, with a new category of collocates relating to mythology and religion found. The seven categories found mostly related to the values of Impact, Timeliness, and Negativity which related to at least three categories. There were also a few categories relating to Proximity, Superlativeness, and Eliteness, but the values were not as dominant.

4.2.2 Nodes *heatwaves* and *heat waves*

The frequency of the plural nodes in the *Daily Mail* corpus was clearly the smallest out of all the corpora, which resulted in the lowest number of relevant collocates. 68 collocates over the MI score of 6.0 and fitting the criteria were found, and they were combined into four semantic categories. Most of the collocates that were labelled “Undetermined” in this case related to categories found in the analysis of the previous nodes but were too few to be counted as a category in this case. The small number of collocates was not seen as an issue, because this method of analysis still brought up the largest categories relating to the strongest collocates of these nodes. For example, Baker (2023, 86) stated that categories usually emerge from an analysis of 30-100 collocates, and the amount of

collocates found is inside this range. The categories, number of collocate types and tokens, and the categories' definitions are detailed in Table 22 based on the number of tokens in each category.

Table 22. Semantic categories of the collocates of *heatwaves* and *heat waves* based on MI Score in the *Daily Mail*.

Category	Types	Tokens	Definition
	Total 68	Total 84	
1. Defining heatwaves	12	16	Related to defining and naming heatwaves, prediction of heatwaves, and mentions of causes of heatwaves.
2. Other phenomena	12	14	Mentions to other phenomena either relating to weather or global issues.
3. Effects of heatwaves	9	11	Descriptions of heatwaves causing effects, objects of the effects, and descriptions of surviving heatwaves.
4. Location references	7	11	Names of places or generic references to location.
Undetermined	28	32	Relating to none of the categories.

The strongest collocates of the plural nodes were quite similar to the ones found with the singular nodes in this corpus. However, collocates relating to the evolution of heatwaves, danger and discomfort, mythology and religion, and violence did not appear as categories. This might suggest that the individual instances of heatwaves are represented with a stronger emphasis on the negative and dangerous nature of the phenomenon than heatwaves as a whole. Another difference between the singular and plural form collocates was that collocates relating to other large-scale phenomena appeared only with the plural nodes. This finding was also made in *The Guardian's* corpus. The collocates in all four categories are given in Table 23 below.

Table 23. Collocates in the semantic categories.

Category Subcategory	Types	Tokens	Collocates
1. Defining heatwaves	12	16	
Prediction of heatwaves	3	7	<i>follows, expected, say, future</i>
Definition and naming	6	6	<i>joke, declared, names, natural</i>
Causes of heatwave	7	10	<i>causes, led, bring, caused</i>
2. Other phenomena	12	14	
Related to weather	7	9	<i>winters, hurricanes, droughts, storms, icy, forest, sunlight</i>
Other phenomena	5	5	<i>rises, bans, hosepipe, price, strikes</i>

3. Effects of heatwave	9	11	
Describing effects	3	5	<i>led, seen, comes</i>
Surviving a heatwave	5	5	<i>tips, struggle, gives, struggling, page</i>
Objects of effects	1	1	<i>grapes</i>
4. Location references	7	11	<i>Netherlands, Japan, Surrey, northern, countries, Continent, across</i>

Collocates in the first category, “Defining heatwaves”, related to predicting, defining, naming, and explaining the causes of heatwaves. An interesting finding was that the third type of collocates did not appear with the singular nodes, suggesting that causes for heatwaves were covered more in relation to the phenomenon as a whole than with single instances. With the singular nodes, several collocates related to quotes from elite figures, such as scientists. These kinds of collocates did not appear as prominently here. Furthermore, collocates related to commenting heatwaves did not appear with the plural forms. These features demonstrate that perhaps fewer quotations and comments were reported in conjunction with the plural form phenomenon. The only news value relating to these collocates is the value of Timeliness.

Collocates in the second category, “Other phenomena”, came in lists of different phenomena alike the collocates in *The Guardian* corpus. However, while collocates grouped into this category in *The Guardian*’s corpus related to phenomena of a global scale, such as extinctions and starvation, the phenomena here seemed to be more local, as mentions besides weather were of hosepipe bans, price rises, and strikes. The focus was perhaps more on events happening simultaneously with heatwaves and not on phenomena of similar scope or threat. Examples are given in Table 24. Even though these collocates were a bit different, they were seen to relate to this category as all the collocates appeared in the same context of lists of phenomena, and thus behaving similarly to other phenomena in *The Guardian*. Akin to the collocates grouped into this category in *The Guardian*’s corpus, the collocates here relate to the news value of Negativity, as they described things that are often seen to have or threaten to have negative consequences.

Table 24. Example concordances of the collocates in the category “Other phenomena”.

Record-breaking temperatures led to	<i>heatwaves</i>	, droughts and forest fires across the region
meltdown amid strikes , punishing	<i>heatwaves</i>	and price rises
extreme weather events in Ireland such as	<i>heatwaves</i>	, droughts , storms and flooding

Collocates in the third and fourth categories were like the similarly categorised singular nodes' collocates and relate to the same news values as them. In the third category, collocates were related to describing the effects of heatwaves, objects of these effects, and what it is like to survive heatwaves. However, there were no collocates related to concrete effects caused by heatwaves, as there were with the singular nodes. Collocates in the fourth category referred to locations, and like with the collocates of the singular nodes, these references were all, except for *Japan* and *countries*, in the Western world. News values relating to the third category are Impact, Negativity, which did not emerge from the singular nodes' collocates, and Timeliness, while the fourth category relate only to the value of Proximity.

These four semantic categories into which the strongest collocates of the nodes *heatwaves* and *heat waves* in the *Daily Mail*'s corpus were grouped into already appeared in previous analysis. Only four news values were found to relate to these categories; Negativity and Timeliness, which appeared two times, and Impact and Proximity, which both appeared once. In comparison to the corpus of *The Guardian*, differences between the collocates of the singular and plural forms were larger.

4.3 *The Times of India* Corpus

The Times of India corpus consisted of 114,279 words. All four node word forms were present in the corpus, but the singular forms were significantly more frequent than the plural ones. Unlike in the corpora of the British news outlets, the spelling with a gap was close to the number of spellings without a gap, and the second most frequent node was *heat wave*, when in the two former corpora it was *heatwaves*. The frequency of each node word is given in Table 25 below.

Table 25. Frequency of each node word in *The Times of India* corpus.

Node	Frequency
<i>heatwave</i>	488
<i>heat wave</i>	246
<i>heatwaves</i>	84
<i>heat waves</i>	69

4.3.1 Nodes *heatwave* and *heat wave*

The nodes *heatwave* and *heat wave* had 105 collocate types over the MI score of 6.0 and fitting the criteria. These collocates were connected to six semantic categories, displayed in Table 26. The collocates were mostly similar to the ones in the British corpora as no new categories appeared. However, collocates related to alerting of a heatwave and describing the end or lack of a heatwave were found in this corpus, which did not appear in the previous ones. The presence of these collocates might be a result of India's climate, where heatwaves have been more frequent and the amount of heat higher, possibly leading to a stronger need to alert of heatwaves and inform when a heatwave, and its dangerous effects, are over. Another explanation could be that India has a clearer structure for defining and addressing heatwaves, which would result in increased reporting of alerts and heatwaves' ends. In addition, the semantic categories "Heat and fire", "Danger and discomfort", and "People and organisations" analysed from *The Guardian* corpus did not appear with these nodes. Similarly, collocates referring to mythology or religion did not appear, which was a category in the *Daily Mail's* corpus.

Table 26. Semantic groups of the strongest collocates of *heatwave* and *heat wave* based on MI Score in *The Times of India*.

Category	Types Total 105	Tokens Total 476	Definition
1. Defining heatwaves	29	258	Related to defining and naming heatwaves, prediction of heatwaves, causes of heatwaves, researching heatwaves, and alerting of heatwaves.
2. Nature of heatwave	10	71	Descriptions of the length or strength of a heatwave and the action of getting longer or stronger
3. Evolution of heatwave	20	49	References to the beginning or end of a heatwave, descriptions of a heatwave moving, number of heatwaves, and references to time.
4. Effects of heatwave	18	48	Descriptions of a heatwave causing effects, mentions of effects it has caused, objects of the effects, and descriptions of surviving a heatwave.
5. Location references	10	19	Names of places or generic references to location.
6. Violence	6	16	Words that are related to violent acts or violent ways to behave.
Undetermined	12	15	Relating to none of the categories.

The largest number of collocates related to the category “Defining heatwaves”, presented in Table 27. These collocates were somewhat similar to those grouped into this category in previous corpora. A significant difference was that collocates related to alerting of heatwaves were present in this corpus, as discussed previously. Additionally, there were no collocates related to naming heatwaves, unlike in the *Daily Mail* and *The Guardian*. This is presumably due to a cultural difference between the nations. According to *The Indian Express*, naming heatwaves at all is a new practice that originated in Spain and has not been taken up in India (Express Web Desk 2022), which might explain why collocates related to naming did not come up.

Table 27. Collocates in the category defining heatwaves.

Category Subcategory	Types	Tokens	Collocates
1. Defining heatwaves	29	258	
Defining heatwaves	13	174	<i>threshold, defines, declaring, declared, declare, officially, condition, conditions, considered, breach, qualitatively, criteria, HWD</i>
Alerting of a heatwave	9	68	<i>sounds, sends, regarding, alert, alerts, implementing, communicating, warnings, yellow</i>
Predictions of a heatwave	3	7	<i>sight, potential, forecasted</i>

Causes of a heatwave	2	7	<i>exacerbated, contributed</i>
Researching heatwaves	2	2	<i>monitors, assess</i>

Another interesting difference arose from the concordance lines of these collocates, as there were several references to a heatwave defined as not happening, which did not appear a single time in the analysis of the British corpora. This theme does not unequivocally relate to any news value, as the lack of a heatwave is not presented as positive or negative. When looking at the larger context, there are a couple of mentions of unexpectedness, which represents the lack of a heatwave surprising, but this is not true for all cases. In addition, there were several references to heatwave-*like* conditions, emphasizing a weather that is almost but not quite a heatwave, which similarly is not connected to any distinct value. Examples of both features are presented in Table 28.

Table 28. Example concordance lines describing a heatwave not happening and heatwave-like conditions.

temperatures did not breach the	<i>heatwave</i>	threshold in any district
too low to officially declare a	<i>heatwave</i>	in the city
Meanwhile,	<i>heatwave</i>	was not declared anywhere in the state
In a major relief to people, no	<i>heatwave</i>	conditions are likely in any part of
the coastal Andhra Pradesh witnessed	<i>heatwave</i>	-like conditions , as the temperature crossed
temporary fall in temperature,	<i>heatwave</i>	-like conditions may prevail until next

Collocates in this group relate to four news values: Negativity, Impact, Eliteness, Proximity, and Timeliness. The first two values are denoted the strongest by the collocates related to alerting, as something that gets alerted of presumably causes negative impacts and creates a reason to know of its existence, whether it is dangerous or merely inconvenient. Eliteness and Proximity both emerge from the concordance lines, as the collocates appeared with quotations of elite figures and especially the ones describing alerts and declarations of heatwaves had proximate locations as their objects.

Collocates in the second largest category, “Nature of heatwave”, were somewhat different compared to the ones in *The Guardian* corpus, as the collocates here did not represent extraordinariness. In *The Guardian* corpus, collocates in this category represented heatwaves as unique and record-breaking in nature, while the current collocates, presented in Table 29, seemed to lack this meaning. As a result, there is no clear relation to any news value. Some collocates grouped into this category can be considered negative (*severe, relentless, refuses*), and some present tense verbs appear. Additionally, a couple of collocates are linked to impact in their concordance lines. However, all these are represented through just a few collocates, and thus do not significantly link any news value to this category. This is the first instance where no news value is connected to a category.

Table 29. Collocates in the categories “Nature of heatwave” and “Evolution of a heatwave”.

Category Subcategory	Types	Tokens	Collocates
2. Nature of heatwave	10	71	
Intensity of heatwave	4	62	<i>prevalence, severe, unabated, relentless</i>
Length of heatwave	6	9	<i>zoomed, refuses, cumulative, persists, prevailed, continuation</i>
3. Evolution of a heatwave	20	49	
Beginning of a heatwave	7	15	<i>commenced, gripped, grip, return, revives, revived, revival</i>
A heatwave moving	3	10	<i>sweeps, swept, sweep</i>
The end of a heatwave	5	10	<i>exits, abate, ended, exempted, relent</i>
Temporal references	2	7	<i>midst, ongoing</i>
Number of heatwaves	3	7	<i>hattrick, single, broader</i>

The third category, “Evolution of a heatwave”, consisted of collocates otherwise similar to those found in the corpora of the British outlets, except that it included several collocates describing a heatwave ending, represented as a subcategory in Table 29. As stated earlier, it is hard to determine why these collocates appeared in this outlet and not the two former ones, as the collocates do not relate to any unique news value. It was theorised at the start of this section that perhaps India has a

clearer definition of what is considered a heatwave or a clearer structure of how heatwaves are informed about, which would result in a different form of reporting. Or perhaps, as temperatures in India are constantly quite high, it is important to define when a heatwave, and the dangerous amount of heat it brings, is over and temperatures considered as normal again. Despite this difference, the news values relating to this category were the same as in *The Guardian*'s corpus: Proximity and Timeliness, with the former resulting from locations as objects of collocates referring to a heatwave moving or beginning, and the latter from the use of present tense verbs.

Collocates grouped into the final three categories referred to effects of a heatwave, locations, and violence, as displayed in Table 30. Collocates describing the effects of a heatwave were similar and relate to the same news values as the collocates in the same category in the two former corpora. These news values are Impact, Negativity, and Timeliness. Negativity is present in some of the collocates themselves as they had negative prosody or described undesirable events (*disrupting, braces, endure, grappling, hospitalisations*), and nearly all other collocates referred to negative effects, even if the collocate word itself was not negative. In addition, several collocates appeared with a reference to a location where the effects of a heatwave were taking place, but too few to relate the category to the value of Proximity. The collocates relating to violence also denote these same three values, with the addition of Superlativeness and Proximity, as these collocates focused on the intensity of heatwaves and had locations as objects of the intense effects. These same values came up with the violence-related collocates in the previous corpora, apart from Proximity not appearing in the *Daily Mail*.

Table 30. Collocates in the categories “Effects of a heatwave”, “Location references”, and “Violence”.

Category Subcategory	Types	Tokens	Collocates
4. Effects of heatwave	18	48	
Surviving a heatwave	6	33	<i>braces, experienced, endure, prepared, grappling, lightly</i>
Describing effects	8	10	<i>offset, gives, disrupting, delaying, brakes, amplified, claims, triggers</i>

Objects of effects	2	3	<i>infant, Vizagites</i>
Concrete effects	2	2	<i>hospitalisations, converted</i>
5. Location references	10	19	<i>marine, Muzaffarpur, Kashi, Kaimur, Valmikinagar, own, Singhbhum, Rohtas, Malanjhand, Bhadrachalam</i>
6. Violence	6	16	<i>torment, reels, reel, reeled, mayhem, battle</i>

The collocates grouped into the fifth category of “Location references” denote the value of Proximity, similar to the previous corpora, but there was a clear difference in comparison to the British outlets. The British outlets had mentions to several distinct locations around the world, with an emphasis on Europe and the Western world, while in this outlet all location references relating to all categories that came up were in India, with just a couple of exceptions. Thus, akin to the *Daily Mail*, all location references were proximate.

In conclusion, six semantic categories were found in the strongest collocates surrounding the terms *heatwave* and *heat wave* in *The Times of India* corpus. There were no semantic categories that did not appear in the British datasets. However, collocates related to a heatwave ending, not existing, and describing alerting of them were found, which did not appear in the previous corpora. The semantic categories found related the strongest to the values of Impact, Negativity, Proximity, and Timeliness, which all appeared with at least three out of six categories. Superlativeness and Eliteness also appeared both in connection to a single category.

4.3.2 Nodes *heatwaves* and *heat waves*

The nodes *heatwaves* and *heat waves* had 79 collocate types fitting the criteria and they were grouped into five semantic categories. Similarly to the corpora of *The Guardian* and the *Daily Mail*, collocates related to other phenomena appeared only with the plural nodes, which in the case of this corpus, consisted only of references to other weather phenomena. In addition, collocates relating to location references and violence which appeared with the singular nodes did not appear as categories here.

The categories, their definitions, and the number of types and tokens in each are given in Table 31 below.

Table 31. Semantic categories of the collocates of *heatwaves* and *heat waves* based on MI Score in *The Times of India*.

Category	Types Total 79	Tokens Total 139	Definition
1. Effects of heatwaves	13	29	Descriptions of a heatwave causing effects, mentions of effects it has caused, objects of the effects, and descriptions of surviving a heatwave.
2. Nature of heatwaves	12	25	Descriptions of the length or strength of a heatwave and the action of getting longer or stronger.
3. Defining heatwaves	15	24	Related to defining heatwaves, prediction of heatwaves, causes of heatwaves, number of heatwaves, researching heatwaves, and alerting of heatwaves.
4. Evolution of heatwaves	13	19	References to the beginning or end of a heatwave, descriptions of a heatwave moving, and references to time.
5. Other weather phenomena	4	11	Mentions to other weather phenomena.
Undetermined	22	31	Relating to none of the categories.

Collocates in the largest category, “Effects of heatwaves”, were similar as with the singular nodes and those in the previous corpora with no distinguishing features. However, the news values emphasised were different. In previous instances of collocates relating to the effects of heatwaves, Impact, Negativity, and Timeliness have been strong, while with these collocates only Impact holds a significant connection. In addition, the value of Proximity appears with these collocates as the majority of them appeared with references to a location. This demonstrates that the representation of the effects of heatwave as negative was stronger with the singular nodes’ collocates than with the plural nodes’ ones. These collocates are displayed in Table 32.

Table 32. Collocates in the categories “Effects of heatwaves” and “Nature of heatwaves”.

Category Subcategory	Types	Tokens	Collocates
1. Effects of heatwaves	13	29	
Surviving a heatwave	5	12	<i>immune, grappled, adapting, experienced, prevention</i>
Concrete effects	1	6	<i>impacts</i>
Objects of effects	3	6	<i>tomato, human, crops</i>

Describing effects	4	5	<i>influenced, created, poses, impacted</i>
2. Nature of heatwave	12	25	
Intensity of heatwave	7	17	<i>intensity, unprecedented, (record-)breaking, times, extreme, coupled, particularly</i>
Length of heatwave	5	8	<i>prolonged, third, prevailed, longer, continuing</i>
3. Defining heatwaves	15	24	
Prediction of heatwave	3	7	<i>common, meteorologist, unlikely</i>
Researching heatwaves	3	5	<i>natural, assessment, study</i>
Commenting heatwaves	3	5	<i>recognized, stating, stressed</i>
Causes of heatwaves	4	4	<i>happens, causing, influenced, policies</i>
Definition	1	2	<i>usually</i>
Alerting of heatwaves	1	1	<i>alerts</i>
4. Evolution of heatwaves	13	19	
Temporal references	6	9	<i>2nd, (pre-)industrial, once, soon, early, current</i>
Beginning of heatwaves	3	5	<i>occurrence, occurred, occur</i>
Number of heatwaves	3	4	<i>rounds, frequency, frequent</i>
A heatwave moving	1	1	<i>sweep</i>
5. Other weather phenomena	4	11	<i>coldwaves, fire, droughts, earthquake</i>

Collocates in the second category referred to the length or strength of heatwaves. Unlike collocates in the same category with the singular nodes in this outlet, these collocates did focus on the extraordinary nature of heatwaves with collocates such as *intensity, unprecedented, (record-)breaking, extreme, and prolonged*. These demonstrate the news values of Impact, Superlativeness, and Unexpectedness. There were some mentions of the nature of heatwaves being negative, but they were rare, and thus not seen to promote the value of Negativity.

The last three categories consisted of collocates related to defining heatwaves, the evolution of heatwaves, and other weather phenomena. The collocates in these categories are given in Table 32 above. All the categories are connected to only a single news value. The collocates related to defining heatwaves denote Eliteness through quotations from elite figures. In this corpus, the collocates related to commenting heatwaves also referred to meteorologists and scientists, unlike the collocates in the *Daily Mail*, which referred to celebrities. In addition, they were not evaluative of the speaker as several collocates were in the *Daily Mail*. Examples are provided in Table 33.

Table 33. Example concordances of Eliteness in the category “Defining heatwaves”.

to the state meteorologist HP Chandra,	<i>heatwaves</i>	are likely to occur
An IIT-Ganhinagar study predicts that severe	<i>heatwaves</i>	could be 30 times more
southeast Asia, scientists stressed that early	<i>heatwaves</i>	are particularly damaging and
said, “Although we have recognized	<i>heatwaves</i>	as one of the deadliest disasters,

Collocates in the fourth category, “Evolution of heatwaves”, relate only to the value of Timeliness. However, the collocates differed from the previous ones found in this category. In previous corpora and with previous node words, this category mostly referred to the time of reporting, but in this case, several of the references were also to the past or the future, for example, (*pre-*)*industrial* referred to pre-industrial times and *once* to once every five years.

The fifth, and final, semantic category consisted of collocates describing other weather phenomena, which have appeared in each corpus together with the plural nodes. However, in the other corpora, the collocates have referred to various kinds of phenomena, not only weather-related. Thus, in this outlet, the representation of heatwaves focused more on contrasting heatwaves with other weather events, rather than harmful phenomena of other nature. These collocates denote the value of Negativity.

The strongest collocates of the nodes *heatwaves* and *heat waves* related to five semantic categories in *The Times of India*’s corpus. The only news value that related to more than one category was Impact, which related to two. Eliteness, Negativity, Proximity, Superlativeness, Timeliness, and Unexpectedness all appeared once. This shows that the values with the plural nodes were quite inconsistent.

4.4 The *Hindustan Times* Corpus

The *Hindustan Times* corpus consisted of 110,816 words. Similarly to *The Times of India* corpus, all four node words were found in the corpus with a clear emphasis on the singular forms. This seems to

suggest that all four outlets emphasise the coverage of single instances of heatwaves while the Indian outlets are more likely to use both gapless and gap-included spellings of the word. The frequency of each node word in this corpus is given in Table 34.

Table 34. Frequency of each node word in the *Hindustan Times* corpus.

Node	Frequency
<i>heatwave</i>	327
<i>heat wave</i>	131
<i>heatwaves</i>	95
<i>heat waves</i>	47

4.4.1 Nodes *heatwave* and *heat wave*

In the *Hindustan Times* corpus, the nodes *heatwave* and *heat wave* appeared with 121 collocate types over the MI Score of 6.0 and fitting the analysis criteria. These collocates were connected to five semantic categories, none of which were new compared to the other corpora. This was also the smallest number of categories found for the singular nodes' collocates out of the four corpora. The new kinds of collocates found in *The Times of India* corpus, which related to alerting of a heatwave and a heatwave not happening were found also in this corpus, but collocates related to the end of a heatwave were not present. Types of collocates that appeared in previous corpora but were not categories with these nodes include "Location references", "Heat and fire", "Danger and discomfort", "People and organisations", and "Mythology and religion". The five semantic categories, their definitions, and the number of types and tokens in them are given in Table 35 below.

Table 35. Semantic categories of the collocates of *heatwave* and *heat wave* based on MI Score in the *Hindustan Times*.

Category	Types	Tokens	Definition
	Total 121	Total 356	
1. Defining heatwaves	26	170	Related to defining heatwaves, descriptions of researching heatwaves, predicting heatwaves, and commenting heatwaves
2. Nature of heatwave	12	61	Descriptions of the length or strength of a heatwave, and the action of getting longer or stronger

3. Effects of heatwave	18	33	Descriptions of a heatwave causing effects, mentions of effects it has caused, objects of the effects, and descriptions of surviving a heatwave.
4. Evolution of heatwave	17	30	References to the beginning of a heatwave or the number of heatwaves, descriptions of a heatwave moving, description of changes in temperature, and references to time.
5. Violence	13	23	Words that are related to violent acts or violent ways to behave.
Undetermined	35	39	Relating to none of the categories.

The largest number of collocates related to defining heatwaves. As in *The Times of India* corpus, there were no references to naming heatwaves, unlike in both British corpora. Additionally, there were no strong collocates related to the causes of a heatwave, which appeared in both *The Guardian* and *The Times of India*. All analysed collocates are provided in Table 36.

Table 36. Collocates in the semantic categories.

Category Subcategory	Types	Tokens	Collocates
1. Defining heatwaves	26	170	
Definition	9	133	<i>tag, spatiotemporal, slim, qualifies, defines, calendar, declared, conditions, condition</i>
Alerting of a heatwave	4	22	<i>watch, warning, directions, colour</i>
Researching heatwaves	8	8	<i>researcher, climatology, exceeds, decipher, occurrence, identify, assessment, precise</i>
Prediction of a heatwave	3	4	<i>prone, unlikely, breach</i>
Commenting a heatwave	2	3	<i>detailed, noted</i>
2. Nature of heatwave	12	61	
Intensity of a heatwave	4	35	<i>relentless, severe, immense, prevalent</i>
Length of a heatwave	8	26	<i>persists, persist, persisted, prevailing, prevailed, longest, prolonged, lasts</i>
3. Effects of a heatwave	18	33	
Surviving a heatwave	7	21	<i>encounter, braves, procedure, respite, experience, operating, witnesses</i>
Describing effects	5	6	<i>undeterred, extends, trimmed, negatively, suspected</i>
Objects of effects	4	4	<i>federally(-held), refugees, travellers, matters</i>
Concrete effects	2	2	<i>toll, shortages</i>
4. Evolution of a heatwave	17	30	
Beginning of heatwave	8	14	<i>occurrences, occurs, manifesting, grips, gripped, gripping, grip, descended</i>
A heatwave moving	3	7	<i>sweeps, swept, creeps</i>
Temporal references	3	5	<i>yrs, Jun, ongoing</i>

Number of heatwaves	2	3	<i>fewer, successive</i>
Changes in temperature	1	1	<i>pushed</i>
5. Violence	13	23	<i>reels, reel, reeling, reeled, rages, onslaught, plunged, blast, struck, battling, punishing, marred, fierce</i>

Alike collocates grouped into the category “Defining heatwaves” in previous corpora, several collocates were accompanied by references to elite figures, scientists and weather departments in this case. As in *The Times of India* corpus, collocates related to commenting a heatwave also referred to scientists and other experts, not celebrities as in the *Daily Mail*. There were also some mentions of heatwaves not happening and heatwave-like conditions, similar to *The Times of India* corpus. Examples are given in Table 37. In addition, the concordance lines revealed several references to a heatwave defined as not happening, similar to *The Times of India*. This category and the collocates in it relate to the news value of Eliteness. Especially collocates related to alerting of heatwaves have additionally a relation to the value of Negativity, but they were too few to connect the entire category to this value.

Table 37. Example concordances of the value of Eliteness and references to a heatwave not happening.

The MeT centre declared	<i>heatwave</i>	in Purnea, Bhagalpur, Sheikhpura,
IMD noted that	<i>heatwave</i>	conditions are likely to prevail in
MeT centre has issued a yellow colour warning for	<i>heatwave</i>	in Bhabhua, Gaya and
but the weather did not breach the	<i>heatwave</i>	threshold
a day prior when Mumbai escaped a	<i>heatwave</i>	by a slim margin of 2 degrees Celsius
same on Tuesday and Wednesday, with a	<i>heatwave</i>	conditions unlikely to take grip in the

Collocates describing the nature of a heatwave somewhat focused on its extraordinary nature (*relentless, severe, longest, immense*), which relates the category to the values of Superlativeness, Impact, and Unexpectedness. In addition, the concordance lines displayed that collocates referring to

length appeared mostly in quotations from weather companies or forecasters and were thus displaying Eliteness. In the previous corpora, collocates referring to the nature of heatwaves were presented without a mention of who had evaluated the heatwave as such. Quoting elite figures can give the specific evaluation more credibility, which could be the reason behind this feature. In addition to the aforementioned values, Timeliness is also connected to these collocates.

The collocates grouped into categories of “Effects of a heatwave”, “Evolution of a heatwave”, and “Violence” did not hold any unique features or news values in comparison to the previous corpora. Collocates related to the effects of a heatwave focused on describing a heatwave creating effects, the concrete effects created, objects of these effects, and what it is like to survive a heatwave. These relate to the news values of Impact, Negativity, and Timeliness. Collocates in the fourth category related to the evolution of a heatwave had temporal references and described a heatwave moving or beginning, the number of heatwaves, and changes in temperature, all of which relate to the values of Proximity and Timeliness. Finally, collocates related to violence represented a heatwave as causing effects violently and being of a violent and intense nature. These collocates relate to the values of Impact, Negativity, Proximity, Superlativeness, and Timeliness. While no characteristics were different compared to all previous corpora, one difference in comparison to *The Times of India* corpus stood out. In *The Times of India* corpus, all found location references were about India, but in this corpus, they included places further away, such as Europe or America. Examples are given in Table 38. These were not considered proximate due to the long distance but were still an interesting difference between the two Indian outlets.

Table 38. References to locations outside of India in the categories “Evolution of a heatwave” and “Violence”.

A punishing dry-	<i>heat wave</i>	is baking the US
Europe is battling an unprecedented	<i>heatwave</i>	during the peak of
while parts of China reeled from intense	<i>heatwave</i>	, there was extreme flooding
But, a weeks-long	<i>heatwave</i>	that swept through western and central Europe

As a *heatwave* has **gripped** the northern hemisphere, with

Life-threatening *heatwave* **sweeps** across 14 US states, break records in

Overall, five semantic categories were found in the collocates surrounding the terms *heatwave* and *heat wave* in the *Hindustan Times* corpus, with no distinguishing types of collocates found. The dominant news values relating to these collocates and their categories were Timeliness and Impact, which appeared in relation to at least three categories out of five. There were also a couple of instances of Eliteness, Negativity, Proximity, Superlativeness, and Unexpectedness, which were not as prominent.

4.4.2 Nodes *heatwaves* and *heat waves*

The nodes *heatwaves* and *heat waves* appeared with 98 collocate types fitting the analysis criteria, and they were grouped into five semantic categories. No new characteristics emerged with these node words' collocates in comparison to the previous analysis. The familiar difference between singular and plural nodes of collocates relating to other large-scale phenomena appearing only with the plural nodes existed in this corpus too. In addition, collocates referencing locations appeared only with these plural nodes, while collocates related to violence appeared only with the singular ones in this corpus. The categories, their definitions, and the number of types and tokens in each are given in Table 39.

Table 39. Semantic categories of the collocates of *heatwaves* and *heat waves* based on MI Score in the *Hindustan Times*.

Category	Types	Tokens	Definition
	Total 98	Total 148	
1. Location references	12	30	Names of places or generic references to location.
2. Effects of heatwaves	23	30	Descriptions of heatwaves causing effects, mentions of effects they have caused, objects of the effects, and descriptions of surviving heatwaves.
3. Other phenomena	14	22	Mentions to other phenomena either relating to weather or global issues and words describing the phenomena.
4. Defining heatwaves	19	22	Related to defining heatwaves, prediction of heatwaves, causes of heatwaves, researching heatwaves, commenting heatwaves, and alerting of heatwaves.

5. Nature of heatwaves	8	15	Descriptions of the length or strength of heatwaves and the action of getting longer or stronger.
6. Evolution of heatwaves	8	15	References to beginning of heatwaves, number of heatwaves, changes in temperature, and references to time.
Undetermined	14	14	Relating to none of the categories.

As no distinguishing features were found from the strongest collocates of the plural nodes in this corpus, the findings will be presented briefly. All analysed collocates are displayed in Table 40. The largest amount of collocates related to location and included both names of places and more general references. Similarly to the collocates of the singular nodes in this corpus, the location references included plenty of locations outside of India, unlike the collocates in *The Times of India* corpus. Over half of the references did not relate to India (*Australia, Spain, Europe*) or were very general in reference (*marine, hemispheres, continental*).

The collocates related to the effects of heatwaves consisted of similar topics as in the previous corpora. They focused on describing heatwaves causing effects, concrete effects caused, objects of these effects, and what it is like to survive a heatwave with several collocates denoting negativity (*aggravating, grappling, dehydration, respiratory*) or pertaining negative contexts in the concordance lines.

Collocates in the third category related to other phenomena appeared in lists with the node terms, and similarly to the *Daily Mail* corpus and unlike *The Times of India* one, the collocates included references to phenomena of other types than mere weather, which were of a local nature. The fourth category, “Defining heatwaves”, consisted of all types of collocates related to defining heatwaves that appeared in the previous corpora apart from collocates related to naming. The types were related to defining, predicting, researching, and commenting heatwaves, as well as alerting of them and describing their causes. The last two categories of collocates related to the nature of heatwaves and the evolution of them, collocates in the former of which represented the extraordinary

nature of the phenomenon, while the latter described the beginning, movements, and other changes in heatwaves.

Table 40. Collocates in the semantic categories.

Category Subcategory	Types	Tokens	Collocates
1. Location references	12	30	<i>Marathwada, Australia, Spain, Europe, Chhattisgarh, away, marine, hemispheres, continental, arid, swathes, tropical</i>
2. Effects of heatwaves	23	30	
Describing effects	12	15	<i>noticed, hampered, greatly, disproportionate, detrimental, absorbing, aggravating, pose, impacted, claimed, view, left</i>
Surviving heatwaves	5	9	<i>responding, grappling, witnessing, running, experienced</i>
Concrete effects	4	4	<i>suspended, respiratory, problems, dehydration</i>
Objects of effects	2	2	<i>corals, oceans</i>
3. Other phenomena	14	22	
Other weather phenomena	12	20	<i>winters, wildfires, droughts, harsh, deficit, floods, cyclones, excessive, flood, cold, patterns, landslides</i>
Other phenomena	2	2	<i>shortages, shortage</i>
4. Defining heatwaves	19	22	
Definition	6	7	<i>denote, mhw, call, difference, usually, categorizing</i>
Prediction of heatwaves	4	5	<i>likelihood, predict, probability, chance</i>
Causes of heatwaves	3	4	<i>attributable, causing, sinks</i>
Commenting heatwaves	4	4	<i>immediate, create, attention, awareness</i>
Researching heatwaves	1	1	<i>studied</i>
Alerting of heatwaves	1	1	<i>watch</i>
5. Nature of heatwaves	8	15	
Intensity of a heatwave	6	13	<i>(record-)shattering, mega, increasingly, intensity, intense, worse</i>
Length of a heatwave	2	2	<i>continuous, duration</i>
6. Evolution of heatwaves	8	15	
Number of heatwaves	3	9	<i>frequency, increasing, back</i>
Temporal references	2	3	<i>September, until</i>
Beginning of heatwaves	2	2	<i>gripping, happening</i>
Changes in temperature	1	1	<i>ambient</i>

These collocates of the nodes *heatwaves* and *heat waves* and the six semantic categories found from them relate to seven of the nine news values. The most frequent news values were Impact,

relating to “Effects of heatwaves” and “Nature of heatwaves”, Negativity, in connection to “Effects of heatwaves” and “Other phenomena”, and Timeliness, which was denoted by collocates relating to “Effects of heatwaves”, “Defining heatwaves”, and the “Evolution of heatwaves”. In addition to these dominant values, Eliteness appeared in relation to collocates defining heatwaves, Proximity with location references, and Superlativeness and Unexpectedness with collocates relating to the nature of heatwaves. This makes Impact, Negativity, and Timeliness the most dominant values.

5 Discussion

In this section, the findings from the analysis are discussed further and contrasted with the theory section and previous research on this topic. First, the key features of each news outlet will be summarised, followed by a description of which news values appeared in which outlets. Second, a comparison between the results between the outlets of different political leanings will be done. Lastly, the findings from the outlets of the two different nations will be compared to each other, thus addressing all research questions.

The first analysed news outlet and corpus was *The Guardian*, which had the most extensive coverage of the topic of heatwaves, as the corpus was the largest and included the largest variety of different semantic categories. This finding supports the outlet's own statements of pioneering in environmental reporting and giving the topic more attention than other outlets, which was addressed in Chapter 3.2. The collocates of the node words in this corpus were grouped into two unique semantic categories which appeared in no other corpora: "People and organisations" and "Heat and fire". "Heat and fire" related to the intensity and dangerous nature of a heatwave, making this representation of heatwaves stronger in the corpus. The category "People and organisations" does not so clearly distinguish this corpus from others, as all corpora had references to different elite figures. However, these were more often nameless. Perhaps referring to specific authority figures gives more credibility to the statements made, but this is difficult to ascertain.

Between the singular and plural form nodes in the outlet, the only difference was that prominent references to other phenomena appeared only with plural forms, and "People and organisations" appeared only with the singular forms. These characteristics of reporting in *The Guardian* were similar to previous research findings, as it has been stated that reporting of heatwaves in Europe has focused on the events' record-breaking nature, potential dangers and impacts created, and the latest developments in the weather (Painter et al. 2021).

The dominant news values relating to the semantic categories in *The Guardian* corpus were Impact, Negativity, Proximity, Superlativeness, and Timeliness. These findings supported previous research, as the news values of Negativity, Eliteness, Impact, Proximity, and Superlativeness have been found to relate to reporting of heatwaves and climate reporting in general in Western outlets (Bednarek & Caple 2012, Dahl & Fløttum 2017, Strauss et al. 2022). The only value that was not as apparent in the results of this thesis was Eliteness. In addition, Tang (2022) found that extreme hot weather was framed as abnormal but not dangerous in the UK's news outlets. However, the results of this thesis differed, as Negativity was a dominant value in the outlet, and several categories highlighted either the dangerous nature or negative consequences heatwaves create.

The second analysed corpus was the *Daily Mail*, which was the smallest of all corpora compiled for this thesis. Among the collocates, there was one semantic category unique to this outlet, namely "Mythology and religion", which mostly related to the names of heatwaves. The convention of naming heatwaves came up in *The Guardian* corpus too with collocates referring to the practice of naming, such as *naming* and *dubbed*. Connecting heatwaves with names referring to the underworld enforced the representation of heatwaves as negative. In comparison to previous research, several similar features of reporting heatwaves came up. Of the characteristics that Painter et al. (2021) found, the latest developments in weather and the dangers and impacts created by heatwaves were present, while the record-breaking nature and attempts to respond to heatwaves were not apparent.

There was a significant difference between the semantic categories relating to the singular and plural nodes in the *Daily Mail*'s corpus, as only four categories were found from the plural nodes' collocates, while the same amount for the singular nodes was seven. Perhaps the most interesting difference was that the categories "Violence" and "Danger and discomfort" appeared only with the singular nodes. This can lead to a lesser representation of threat and danger of the phenomenon as a whole, with the focus shifting only to the dangers of individual heatwave instances, which has been argued to be a common and problematic practice in climate change reporting (Robertson 2022).

Overall, the differences between singular and plural node forms' collocates were the largest in this corpus.

The dominant news values in *the Daily Mail* corpus were Impact, Negativity, and Timeliness. This also somewhat supports previous research as the news values of Impact and Negativity have been found to relate to heatwave and climate reporting previously (Bednarek & Caple 2012, Dahl & Fløttum 2017, Strauss et al. 2022). However, the *Daily Mail* lacked the values of Eliteness, Proximity, and Superlativeness as dominant, which have also been found to significantly relate to reporting of the topic previously. Previous studies have also found the value of Positivity relating to the *Daily Mail's* heatwave reporting (Heikkilä 2021, Dahl & Fløttum 2017), but a similar finding was not made in this thesis as no categories or collocates implied Positivity. This might be explained by the change in attitude toward climate change from denial to more likely supportive that has been studied in right-leaning news outlets in the UK (Gabbatiss et al. 2022). Similarly to *The Guardian*, the finding of abnormality but no danger in framing of extreme hot weather reporting by Tang (2022) was not found, as danger and negativity were present in this corpus.

The third analysed corpus was *The Times of India*. The strongest collocates in this corpus were not categorised into any unique semantic categories but collocates relating to the end of a heatwave appeared only in this corpus. The only difference between plural and singular form nodes was that the category "Location references" appeared only with the singular nodes' collocates, while the category "Other phenomena" appeared only with plural nodes. The dominant news values in this corpus were Impact, Negativity, Proximity, and Timeliness; however, only Impact was dominant in the plural nodes' collocates. Previous research on heatwave reporting in India has been quite limited, but it has been noted that climate news has had dominant frames of uncertainty, implicit risk, threat, and politics (Jogesh & Painter 2013, Billet 2010), which is also found to some degree in the present study, as Impact and Negativity especially relate to risk and threat. Uncertainty and politics did not

come up in the data of this study, and neither did extensive use of quotations from politicians or other representatives, which Painter et al. (2020) found.

The fourth and final corpus analysed was the *Hindustan Times*, which had no unique categories or subcategories. The only difference between singular and plural nodes' collocates in this corpus was that "Violence" appeared only with the singular nodes, while "Location references" and "Other phenomena" appeared with plural nodes. This could indicate the similar consequence as in the *Daily Mail*, where single instances of heatwaves were represented as more dangerous rather than the phenomenon as a whole. The most dominant news values in this outlet were Impact, Negativity, and Timeliness, which, like with *The Times of India*, were somewhat similar to previous findings of climate reporting in India. Especially the frames of implicit risk and threat are similar to the finding of the news values of Impact and Negativity being dominant. Similarly to the other Indian corpus, previous findings of extensive quotations or frame of politics did not come up in this analysis of the *Hindustan Times*.

Some differences were found between the reporting of left-leaning and right-leaning news outlets. Between the two British outlets, a significant difference was the amount of reporting itself, as the left-leaning *The Guardian* had a significantly larger number of articles concerning the topic. Otherwise, the reporting between the two political leanings was quite similar as most of the semantic categories and dominant news values appeared with both news outlets. Perhaps the most significant difference was the fact that the *Daily Mail* did not include the semantic categories "Nature of a heatwave" and "Heat and fire", as these two categories significantly emphasised the intensity of heatwaves. The *Daily Mail* was the only outlet where the category "Nature of a heatwave" was not found. Partly resulting from this, the news value of Superlativeness was not dominant in the *Daily Mail* while it was in *The Guardian*. This is perhaps a bit surprising, as the *Daily Mail* has been considered strongly tabloidized, and distinctive characteristics of tabloids include bolder language, as described in Chapter 2.2.2. Another difference was that the *Daily Mail* had evaluative references

related to celebrities commenting heatwaves in addition to neutrally referring to scientists and meteorologists.

In addition, *The Guardian* had location references to places all around the world, while the *Daily Mail* only had references to places in the Western world. It cannot be stated definitively what the reason behind this difference is. However, in Chapter 4.1.1 it was speculated that references to faraway locations might be a result of seeing climate change and its related phenomena as having global consequences and thus being locally significant. If this is the case, then location references to only proximate places could suggest that the *Daily Mail* has a different stance toward the topic. A stronger focus on proximate matters was also apparent in the collocates relating to other phenomena. In this category, *The Guardian* had collocates referring to global phenomena such as extinctions, famine, and starvation, while the *Daily Mail* referred to more local matters of price rises and strikes. Another explanation for this contrast could be different readerships. *The Guardian* (2021) has stated that they have readers in 180 countries all around the world and over 50% of readers in total are from outside the UK, which might be taken into consideration by publishing news from locations all over the world. Similar figures were not found to be published for the *Daily Mail*, and thus this argument cannot be confirmed nor dismissed and remains as a hypothesis.

The hypothesis that the stronger political divide between the British news outlets would result in stronger differences in reporting than between the Indian outlets was somewhat true, as there were significantly fewer differences between the Indian outlets. The semantic categories and news values both were very similar between *The Times of India* and the *Hindustan Times*. The only clear difference between these two outlets was that the right-centrist *The Times of India* had location references only to India, while the left-centrist *Hindustan Times* had location references across the globe. This same difference was also found between the British outlets and might indicate lesser importance of regarding climate change as a challenge with global relevance, as theorised previously, or be a result of demographically different audiences. Neither *The Times of India* nor the *Hindustan Times* have

published information on whether they are read globally or not. On their websites, both outlets only address how significant they are in India (Times Internet 2019, HT Media Group 2020a), and thus it cannot be stated whether differences in readership account for differences in types of location references. In addition to the different location references, the subcategory relating to the end of heatwaves appeared only in *The Times of India*. However, this difference was not seen as significant because the lack of heatwaves and heatwave-like conditions came up in both corpora, which carry the similar meaning of stronger patterns of defining what heatwaves are.

Stronger differences came up when comparing the two nations' reporting to each other as a whole. The most significant differences were that only the British outlets had strong collocates related to naming heatwaves and describing danger or discomfort, while only the Indian outlets had collocates relating to alerting of heatwaves and the lack or end of them. The lack of reference to naming heatwaves was explained in Chapter 4.3.1 as a cultural difference, as the practice of naming heatwaves has not been taken up in India (Express Web Desk 2022). There was not as clear of an explanation for why collocates related to alerting of heatwaves and end of heatwaves were not present in the British corpora, and why collocates related to danger and discomfort did not appear in the Indian corpora. It was theorised that perhaps India has a clearer structure on how to inform and report about heatwaves, which would result in official alerts declared and specific end points determined. However, the UK has had its own alert system for heatwaves since 2004 that "forewarns of periods of high temperatures" (Met Office n.d. b), which seems to contradict this thought. Whatever the reason behind this, especially the collocates related to alerting of heatwaves represent the phenomenon as dangerous and necessary to be protected from, creating a clear difference between the reporting of the two nations. Similarly, collocates relating to danger and discomfort represent heatwaves as more threatening and these collocates were lacking in the Indian corpora. However, the outlets had collocates relating to violence and the intense nature of heatwaves that carry this same representation. Thus, the difference could result from something else.

In addition to the category “Danger and discomfort” not emerging from the Indian outlets, there were no strong collocates related to the heatwave being deadly or killing something. In the British outlets, collocates such as *deadly*, *killed*, and *die* appeared. In section 2.4 it was described how the number of heatwave-related deaths reported in the nations has been significantly different with several more deaths reported in the UK. This finding of no strong collocates distinctively related to heatwaves killing demonstrates this same feature of the deadly nature of heatwaves being reported in a different way in the two nations.

Overall, the four news outlets had distinctive features in their reporting of heatwaves, but there were also significant similarities across all outlets. The singular nodes *heatwave* and *heat wave* appeared significantly more in all corpora, affirming the statement that single climate disasters might be more suitable for news reporting than the larger phenomenon (Bødker & Morris 2021). However, the difference between reporting of single instances versus the phenomenon as a whole with plural tense was larger in both right-leaning outlets. The study by Robertson (2022) found that Northern Europe preferred impartial reporting of climate change with various views taken into consideration, while Asia-Pacific preferred climate action emphasised. This led to the hypothesis that the British outlets might have more variation in their reporting. However, this did not come up in the findings of this thesis, as the strongest collocates did not include climate change-critical features in any outlets.

The news values connected to the semantic categories were also quite similar in all outlets, with some differences in which values dominated over which. The news values that were connected to this data appeared in all outlets, with the exception of Unexpectedness, which appeared in all but the *Daily Mail*. This suggests that the values behind reporting heatwaves are somewhat uniform. Out of the nine news values used in the analysis of this thesis, only two did not come up in any corpora: Personalisation and Positivity. There were some instances of personalisation in the material, but the collocates relating to the value were always too few to count for a clear connection. If the object of effects or endurer of heatwaves was mentioned, in most cases it was an entire nation. Positivity did

not come up in the data at all, showing a clear difference to previous studies where the value has been somewhat present with British news reporting (Heikkilä 2021, Dahl & Fløttum 2017). In addition to these two news values not appearing, the value of Unexpectedness was also quite scarce in the data. It can be assumed that as heatwaves have become such a frequent phenomenon with more monitoring enabling predictions, it is no longer seen as unexpected.

In addition to the same values appearing in all outlets, the values quite consistently related to the same semantic categories throughout the outlets. For example, the effects caused by heatwaves were reported nearly always through the values of Impact and Negativity, while the nature of heatwaves was characterised by Superlativeness and Unexpectedness. This demonstrates that different aspects of heatwaves were reported through different news values, as no news value emerged with all categories in any corpus.

6 Conclusion

This thesis aimed to study how heatwaves are represented in British and Indian news outlets of differing political leanings, and especially to discern through what news values (Bednarek & Caple 2017) the reporting is done. The method was corpus-based discourse analysis and focused on the strongest collocates of the nodes *heatwave*, *heat wave*, *heatwaves*, and *heat waves* based on the MI score. The collocates were grouped into semantic categories which were further related to news values. The research questions for this thesis were as follows:

1. In what ways, and based on which news values, do the British and Indian news outlets in question represent heatwaves?
2. What kinds of differences are there between the representations of heatwaves in the left-leaning and right-leaning news outlets within the countries and are the differences the same in both countries?
3. What kinds of differences can be found between the reporting in the two nations?

Based on findings from previous research, the hypotheses were that due to the different contexts in the two nations, the reporting would be different, and the differences between the political leanings would be bigger in the UK, as the news scene has been described as more politicised while India has been characterised to have less freedom of press and thus less freedom for outlet's individual stances. In addition, former research provided news values and frames that had been previously found from heatwave and climate change reporting, which the findings of this thesis were contrasted against.

From the analysis, eleven semantic categories in total with relevant subcategories were found that related to seven of the nine news values provided as a whole. These categories included, for example, descriptions of heatwaves, discerning their effects, and locations where they appeared. The dominant news values throughout the news outlets were Impact, Negativity, and Timeliness, with the additions of Superlativeness in *The Guardian* and Proximity in *The Times of India*. In addition to

these dominating values, the value of Eliteness appeared in all outlets and the value of Unexpectedness in all except the *Daily Mail*. This answers the first research question.

Differences between the reporting of the two political leanings existed although they were perhaps smaller than initially hypothesised. The differences between left-leaning *The Guardian* and right-leaning the *Daily Mail* included different amounts of reporting altogether with a stronger focus on the intensity of heatwaves in *The Guardian*, and a stronger focus on local matters and quotations from celebrities in addition to scientists and meteorologists in the *Daily Mail*. The only difference that was present also between the Indian outlets was that the right-leaning *The Times of India* had only proximate location references, while the left-leaning *Hindustan Times* referred to locations across the globe. In addition, collocates relating to the end of heatwaves appeared only in *The Times of India*. These answer research question two and support the hypotheses of differences existing in the reporting with these differences being bigger in the UK's outlets.

Differences were also found between the reporting of the two nations. The most frequent nodes differed, as in the UK's outlets the two most popular nodes were *heatwave* and *heatwaves*, while in India, they were *heatwave* and *heat wave*, demonstrating that the phenomenon in general was less covered in the Indian outlets. However, the same difference between the frequency of nodes was also larger in the right-leaning outlets. Additionally, three differences were found in the categories of the collocates: strong collocates related to naming heatwaves and heatwaves killing something appeared only in the British outlets, while collocates relating to alerting heatwaves, and the lack or end of them, appeared only in the Indian outlets. This answers the third and final research question.

The method and framework for analysis in this thesis seemed to be suitable for the research questions as they were able to demonstrate the similarities and differences found in the different outlets. Especially the theory of news values was found to be applicable for analysis of semantic categories, as out of the 51 appearances of categories in the different outlets, only one instance of a single category could not be tied to any news value. However, there are several ways this topic could

be explored further. This thesis focused only on verbal, decontextualised data, and thus further analysis could focus on different formats of producing discourses, such as images, and do a close reading of the texts to get a more extensive picture of the produced discourses. Furthermore, other corpus analytic tools could be used to expand the research further. For example, keyword analysis could help further discern what kinds of themes, representations, and topics arise in the discourse of the nations in focus. The data could also be expanded further. If the differences between the Global North and Global South were to be explored further, outlets from other nations could be added to the data. Also, more outlets from the same nations could be added to the data of the two political leanings to get a more thorough picture of the differences based on politics. The topic could also be widened to account for different phenomena relating to climate change, for example, differences between the reporting of heatwaves, storms, and floods could be analysed to see whether there are differences in representations within the discourse of climate reporting.

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