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**MEDIA REPRESENTATION OF COVID-19 VACCINES:  
CORPUS-ASSISTED DISCOURSE ANALYSIS OF *THE NEW  
YORK TIMES***  
**BA thesis**

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## ABSTRACT

In 2019, the world was introduced to the SARS-CoV-2 coronavirus disease (COVID-19), which turned into a global pandemic. The pandemic and the political measures taken to mitigate the disease were polarising, as different political forces disagreed on the danger posed by the disease and the measures necessary to curb its spread. The development of new vaccines in late 2020 only increased this polarisation and COVID-19 vaccines began to dominate the media and social media discourse worldwide. Media coverage showed widely diverging opinions about the matter. This thesis will look at traditional quality media, specifically *The New York Times*, to see how opinions are developed in a context where emotional undertones and biases are less evident than in tabloids. Analysing the language use of quality media helps to create better communication strategies for future situations like the COVID-19 pandemic.

This thesis consists of an introduction, two core chapters, and a conclusion. The first core chapter will provide an overview of the literature connected to the topic of COVID-19 vaccines and media coverage. The empirical part is divided into two subsections. The first section describes the method used and the second presents the corpus-assisted discourse analysis of *The New York Times* articles from May 2020 and May 2021 regarding COVID-19 vaccines.

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## INTRODUCTION

In 2019 the world was introduced to the COVID-19 coronavirus disease, an infectious disease caused by the SARS-CoV-2 virus. Most infected people with the virus will experience mild to moderate respiratory illness. Those people do not require special treatment, but some will become extremely ill and need medical attention. The virus usually develops into a severe illness in older people and those with underlying medical conditions. Those medical conditions could be cardiovascular disease, diabetes, chronic respiratory disease, or cancer. Even though people in the high-risk groups are the ones to mostly develop a serious illness, anyone can get sick and become seriously ill or even die.

The virus spreads through aerosol droplets from an infected person's mouth or nose when coughing, sneezing, speaking or breathing. To prevent the spread in the first months of the pandemic, people were asked to stay at least one metre apart from others, wash their hands or use hand sanitizers. (WHO, 2023) Perhaps the most significant and visible change was the rule to wear face masks in public spaces, which "remained a source of controversy in the United States during the COVID-19 pandemic" (Lang et al 2021). There was also a strong anti-mask sentiment in the EU.

The distancing and masking measures were the dominant mitigation measures in 2020, in the first phase in the COVID-19 crisis. The situation changed "in January 2021 when different vaccines started to be administered to the population" (Sendra, 2023). The World Health Organization advised people to get vaccinated when it is their turn and to follow local guidelines. Vaccine development started already at the beginning of the pandemic. On March 17, 2020, the first human vaccine trial to protect against the SARS-CoV-2 virus began in the U.S. at a Kaiser Permanente research facility in Seattle, Washington. This vaccine was developed by the biotech company Moderna Therapeutics.

On April 30, 2020, the former president of the United States, Donald Trump,

launched Operation Warp Speed, an initiative to produce a vaccine for COVID-19 as quickly as possible. Eight companies received around 11 billion dollars within this scheme. The first company funded was Merck (April 2020), followed by AstraZeneca and Johnson & Johnson. These companies tried different approaches in developing their vaccines. Not all of the vaccines proved to be successful and not all ended up being approved for use in the U.S. For example, on May 21, 2020, the U.S. government pledged up to 1.2 billion dollars to help fund the AstraZeneca vaccine development. Phase 3 trials of the AstraZeneca vaccine began in the U.S. on August 18. On September 8, 2020, news about paused trials came out. Human trials were put on hold due to a suspected adverse reaction in a British volunteer. On October 23, after an investigation, the FDA allowed the Phase 3 clinical trial to continue. (Corum and Zimmer, 2021) However, the AstraZeneca vaccine was never fully approved for use in the U.S., although it was widely used in Europe, including Estonia.

December 11, 2020, saw the approval of the first COVID-19 vaccine in the USA - the US Food and Drug Administration issued an Emergency Use Authorization for the Pfizer-BioNTech vaccine. (CDC, 2022) The death toll in the U.S. had surpassed 300 000 by the time Sandra Lindsay, a nurse in New York, became the first American outside a clinical trial to receive the COVID-19 vaccine. On December 18, 2020, the U.S. Food and Drug Administration issued an Emergency Use Authorization for the second COVID-19 vaccine - the Moderna COVID-19 vaccine. Over one million people in the U.S. were vaccinated against COVID-19 in less than one month. A third COVID-19 vaccine by AstraZeneca and the University of Oxford was approved for emergency use in the UK on December 30, 2020. The FDA gave the fourth COVID-19 vaccine by Johnson and Johnson approval for emergency use authorization in February 2021. (CDC, 2022)

While different vaccines have been a polarising topic as long as they have been around, the conspiracy theories around COVID-19 vaccines were magnified due to the topic

of mRNA vaccines. According to Pfizer (2023), many people learned about the mRNA technology only because of COVID-19 vaccines, but it is not new to the scientific community. Kiley et al (2022) have said that mRNA vaccines have been in development for more than 30 years. mRNA vaccines are highly effective and can be produced quickly on a large scale. (Kiley et al, 2022) Approving mRNA-based COVID-19 vaccines was a scientific turning point, because it established mRNA as a versatile and flexible technology. For many, the fact that the mRNA-based COVID-19 vaccine was developed just in a year became a somewhat polarising topic. (Pfizer, 2023)

While Pfizer-BioNTech and Moderna COVID-19 vaccines use mRNA technology, AstraZeneca uses double-stranded DNA (Corum and Zimmer, 2021). A report from March 14, 2021, shows that countries like Ireland, Iceland, Denmark and Norway suspended dispensing AstraZeneca vaccine over concerns of blood clotting. On March 22, 2021, results from a large clinical trial showed, however, the AstraZeneca vaccine has an overall efficacy of 79 percent (Corum and Zimmer, 2021). The AstraZeneca vaccine was not the only one to run into difficulties. In April, CDC recommended pausing the use of Johnson and Johnson COVID-19 vaccine in the USA, because of blood clot complications. Ten days after the announcement, after data assessment, the CDC recommended continued use of Johnson and Johnson vaccine for people 18 and older. These decisions and their reversal created further confusion and suspicion in some segments of the general public.

In July 2021, Anthony Fauci, MD, former President Donald Trump's and President Joe Biden's medical advisor, addressed concerns about COVID-19 vaccines being perceived as experimental and not fully tested due to their emergency use authorization status. At the same time, on July 14, Society for Healthcare Epidemiology of America called on medical facilities to require workers to receive the COVID-19 vaccine. By August 3, 2021, 70% of the U.S. citizens were vaccinated. (AJMC Staff, 2021)

With the rise of the Delta variant, a booster shot was introduced on August 12, 2021, to stay ahead of the virus. (The White House, 2021) CDC data showed that the COVID-19 vaccines' efficacy dropped from 90% to 66% following the spread of the Delta variant. (CDC, 2022) In the autumn of 2021, CDC stated that studies provided evidence that, despite the ability of the newer variants to bypass the vaccines, COVID-19 vaccines still offer higher protection than a previous COVID-19 infection and recommended that everyone over 18 years old who had received a Pfizer or Moderna vaccine receive a COVID-19 booster. (CDC, 2022)

Since the process of developing vaccines was both fast and, due to the lack of knowledge both about the COVID-19 coronavirus disease and the new mRNA vaccines, not easy to communicate to the general public, it is important to look at how the events were covered in the media. The general public wished to read about the COVID-19 vaccines, but the process of scientific research was not fast enough to provide information promptly.

My focus will be on the United States, especially the articles from May 2020 and May 2021 in *The New York Times* that speak about the COVID-19 vaccines. My aim is to use discourse analysis on the articles to find how vaccines are described and explained. Discourse analysis allows the text to be studied in the context that it appears in. I plan to conduct the analysis with the help of a corpus tool called Sketch Engine. Corpus-assisted discourse analysis allows both quantitative and qualitative research, which is good for comparing two different time periods.

## **1. COVID-19 VACCINES IN MEDIA: LITERATURE REVIEW**

The topic of COVID-19 has been an integral part of the news all around the world since 2019. In 2020, as they were being developed, vaccines against COVID-19 began to take an essential place in the news. Soon, the topic became a very polarising one – some people wished to get vaccinated, and others were against it.

Language use in newspapers can influence people's attitudes towards the vaccines. Using words and phrases with strong meanings can impact how the reader will feel about vaccines and how likely they will be to get vaccinated. The sources used for this literature review focus on the news in the United States in 2020 and 2021. All used literature has been evaluated according to the CRAAP test to identify whether the publication has currency, relevance, authority, accuracy and purpose. The articles are organised by their relation to my chosen topic starting from the more distant studies and moving towards those more closely related ones.

Research by Perreault and Perreault (2020) and Basch et al (2021) focuses on journalists during the COVID-19 pandemic. Perreault and Perreault (2020) show that writing about the pandemic places journalists in a vulnerable situation, because the situation is new for them, which can lead to misinformation and their work seeming to lack credibility. A journalist can be under a lot of stress since they are responsible for the well-being of the readers while coping with the new situation as well (Perreault and Perreault 2020). Basch et al (2021) argue that newspaper journalists have to be cautious and not sensationalistic in order to increase public confidence in vaccine safety. Journalists are an important link in the communication chain, because their stories shape the public's understanding of vaccines (Basch et al 2021). Both Perreault and Perreault (2020) and Basch et al (2021) agree that the global pandemic was new to the journalists and this may have influenced their work.

A common theme in the literature is the link between the news source and vaccine



hesitancy, analysed in studies by Park et al (2021) and Melki et al (2021). Research indicates that people's perception of the severity of COVID-19 and vaccine uptake are strongly linked to the source type they used (Park et al 2021). Both Park et al (2021) and Melki et al (2021) stress that people who use social media as their primary source of information are more likely to believe in fake news, COVID-19 myths and underplay the severity of COVID-19. In addition, Melki et al (2021) found that people who use interpersonal communication as a means of learning about COVID-19 and vaccines also tend to believe in fake news. Park et al (2021) add that people who use social media as a news source are less likely to get vaccinated. People who use traditional news sources are most likely to get a COVID-19 vaccine and believe in the severity of COVID-19 (Park et al 2021). Melki et al (2021) used a cross-sectional researcher-administered phone survey to find the link between the trust in COVID-19 news and the exposure to the news.

Basch et al (2021), similar to Melki et al (2021), suggest that the way in which vaccines are discussed in newspapers may influence their readers' vaccination behaviours. A similar understanding can be seen in the work of MacKrell (2023), who also found that media shapes the public's understanding of vaccines and vaccine hesitancy. According to MacKrell (2023), media coverage of COVID-19 side effects has caused a nocebo response, a phenomenon where side effects are caused by individual expectations (MacKrell 2023).

The immense quantity of news about the COVID-19 pandemic and the vaccines has resulted in an *infodemic* which makes it almost impossible for readers to grasp everything. (Basch et al, 2021) A joint statement by WHO, UN, UNICEF, UNDP, UNESCO, UNAIDS, ITU, UN Global Pulse, and IFRC from September 2020 explained the infodemic with the fact that COVID-19 is the first pandemic in the time of advanced information technology and social media. An infodemic involves deliberate attempts to spread false information, which harms people's mental and physical health and undermines public health efforts and

countries' ability to stop the pandemic. Disinformation polarised public debate and made people mistrust vaccines and their effectiveness (WHO, 2020). Public health professionals were experiencing difficulties in reaching the readers with recommendations (Basch et al 2021).

Liu et al (2022) share the hypothesis of Palm et al (2021) according to which people exposed to a message saying President Trump *rushed* the approval of COVID-19 vaccines showed an increase in vaccine resistance. The politicisation of the vaccine may have had an effect on vaccine resistance. The corpus-assisted discourse study by Liu et al (2022) places particular attention on newspapers' preferential ways of representing the safety and efficacy of COVID-19 vaccines at the early stage of vaccine development.

Several articles discuss how to fight the infodemic and increase vaccine confidence. On the one hand, Chou and Budenz (2020) found that in order to increase vaccine confidence, an effective strategy would be to acknowledge fears, anger, and other negative emotions, at the same time stressing the stringent safety and efficacy standards of the COVID-19 vaccine. Chou and Budenz (2020) mainly focus on emotions. Statistical information about the vaccines has been shown to be less important than emotions. Emotions influence vaccine risk perceptions and intentions. Vaccine education should not be viewed as "one size fits all", but rather tailored to the emotional state of its audiences (Chou and Budenz 2020).

On the other hand, Paul et al (2021) argue that a lack of knowledge has been associated with distrust in the COVID-19 vaccine. Three simple messages are recommended by WHO for public health communications on vaccines so that the message would unambiguously reach people from lower educational backgrounds. In order for people to get vaccinated, it is important to develop public health messaging that would focus on the safety of the vaccines (Paul et al 2021). The strategies proposed by Choud and Budenz (2020) and Paul et al (2021) to increase vaccine confidence differ from each other. One weighs on the

importance of acknowledging all emotions, including negative ones, but the other only wishes to emphasise messages showing the safety of the vaccines.

A vital component in decision-making is media literacy. Before bringing a new vaccine to the public, multiple steps have to be taken like development, trials, testing, approval from the U.S. Food and Drug Administration, manufacturing, and distribution. In the case of COVID-19, the vaccines went through rigorous clinical trials to ensure their safety (Austin et al, 2022). This is also reflected in the coverage of *The New York Times*.

The first article in *The New York Times* on the topic of COVID-19, called “From Jan. 2020: China Identifies New Virus Causing Pneumonia-like Illness”, was published on January 8, 2020, by Sui-Lee Wee and Donald G. McNeil Jr. The first American outside a clinical trial received the COVID-19 vaccine on December 14, 2020. These dates illustrate that only in under a year many steps for creating a vaccine were taken, which meant that the information environment was constantly evolving. People had to navigate uncertainty to make important decisions. Austin et al (2022) discuss how media literacy is associated with COVID-19 vaccine intentions. Austin et al (2022) have hypothesized that a situation like this made media literacy an essential component of decision-making. According to Austin et al (2022), media literacy influences beliefs, attitudes and behaviours.

Overall, the literature review suggests that there are multiple components of decision-making when it comes to COVID-19 vaccines. Decision-making begins from choosing which type of news outlet to follow, which according to Park et al (2021) and Melki et al (2021) plays a vital role in how people view vaccines. According to Basch et al (2021), choosing a trustworthy news outlet can be difficult during an infodemic and this makes it difficult for public health professionals to reach the readers with recommendations. The literature review brings out multiple strategies for dealing with an infodemic. At the time of the writing of the thesis, no study was found that looked at if and how the means used by

*The New York Times* to talk about COVID-19 vaccines have changed over time. This is the gap my research sought to fill with my preliminary research.

## **2. CORPUS-ASSISTED DISCOURSE ANALYSIS OF *THE NEW YORK TIMES* ARTICLES**

### **2.1 Method**

For my corpus, I gathered articles from *The New York Times* news archive. I chose two different time periods to analyse and compare. The first time period is May 1, 2020, to May 31, 2020, and the second one is May 1, 2021 to May 31, 2021. The time periods were chosen with a one-year gap to see how the discourse on COVID-19 vaccines changed over time. During the first time period, the vaccines were still in the process of making, but in the second time period they were already available for the general public. After limiting the time period, I searched the keyword *vaccine*. The next step was to make sure that only articles discussing COVID-19 vaccines were chosen, because there were some articles related to other vaccines. 359 articles from May 2020 and 671 from May 2021 were gathered that were dedicated to the COVID-19 vaccines.

I uploaded all the texts to a corpus tool called Sketch Engine. Developed in 2003, Sketch Engine is software made for corpus management and text analysis. Sketch Engine has features like ‘word sketch’, ‘word list’ and ‘concordance’. According to Kilgarriff et al (2014), ‘word sketch’ gives a summary of a word’s grammatical and collocational behaviour. The ‘word list’ provides a list of words that is arranged by frequency. The system works through the whole corpus to find and organise the recurring patterns. ‘Concordance’ shows where and how a word was used in the raw data. (Kilgarriff et al, 2014)

Corpus-assisted discourse analysis allows both quantitative and qualitative research, which is good for comparing two different time periods. The findings will show the newspaper’s approach to fighting the infodemic. In addition, I will explore how the coverage of vaccines has changed in time and the possible reasons for it.

## 2.2 Analysis of the use of language in articles of *The New York Times*

The corpus of *The New York Times* articles in May 2020 includes 968,288 words from 359 articles. The corpus for May 2021 includes 769,991 words from 671 articles as shown in Table 1. The word count shows a decrease, whereas the number of articles has increased. When people acquire more knowledge about a topic and feel comfortable expressing themselves in it, they can say what they want using less words. This might be the case for journalists of *The New York Times*, because as all the people over the world, they as well understood the topic of COVID-19 and the vaccines better as more time passed. I will analyse the corpora by different topics. When analysing one specific topic, I will first look at the corpus of May 2020, then May 2021 and then compare the two in order to see how the use of language might have changed in time.

**Table 1. The word and article count of the corpora.**

	May 2020	May 2021	Total
<b>Words</b>	968,288	769,991	1,738,279
<b>Articles</b>	359	671	1,030

The ‘word list’ feature allows to search the lemma, which is the form of a word that is used to represent all other possible forms. I chose to search *vaccin* to give a chance for the different forms of *vaccination* to appear in the results in addition to *vaccine*. The results for May 2020 corpus show 1840 instances of *vaccin* and 21 different word forms. The most used word form is *vaccine* with 1619 appearances in the corpus. The second word in the frequency list is *vaccination* with 98 times. Third is *vaccinate*, which was used 45 times, fourth is *anti-vaccine*, with 27 uses and fifth *vaccine-preventable* with ten uses. Other words in the list are used less than ten times each.

The results for May 2021 corpus show 7804 instances of *vaccin* and 44 different forms. The most used is *vaccine* with 8984 appearances, the second one *vaccinate*, with 2088

appearances, the third is *vaccination* that appears 1373 times, fourth is *unvaccinated* which is used 258 times, fifth *vaccine-hesitant* with 12 times and sixth *anti-vaccination*, with ten times. The rest of the word forms in the corpus are used less than ten times each.

Both May 2020 and May 2021 had the same number of days, but the results show that the COVID-19 vaccines received much more coverage while they were being distributed in May 2021. Both time periods feature the prefix *anti*, which draws attention to something or someone being against the vaccines. The antonym *pro* is used in the corpus only under ten times. The topic of the anti-vaccine movement is shown as a concern in the articles in May 2020: “What if we create a successful Covid-19 vaccine, and a huge chunk of the population refuses to take it? Many anti-vaccine groups are already sowing doubt and paranoia, months or years before a vaccine even exists”. These articles show that anti-vaccine groups are especially active on social media. As mentioned in the literature review of this thesis, Park et al (2021) and Melki et al (2021) stress that people who use social media as their main source of information are more likely to believe in COVID-19 myths. Journalists have to be cautious while bringing attention to a topic like this because, as Austin et al (2022) have said, media literacy influences beliefs, attitudes and behaviours. Even if an article brings out the anti-vaccine movement as a concern, some readers might not interpret it the way as intended by the journalist due to different media literacy skills. In addition, the human brain focuses on things that fit into their cognitive schema (Michalak, 2019). While reading newspapers, readers concentrate initially on already familiar themes and topics. A person who is against vaccines might focus only on the parts, which support their ideas and beliefs. Using words like *anti* might draw the attention of some people, but this does not mean that their thought patterns will change, and the purpose of the article might not get achieved.

The results of the ‘word list’ function show that in May 2020 and May 2021 the most

used form of the lemma *vaccin* is *vaccine*, which should be studied in depth. The ‘word sketch’ feature shows the behaviour of specific words, which helps to understand how these words are used in context and the language patterns. Adjective predicates modify or describe the subject. The subject in this case is the *vaccine*. Figure 1 shows the adjective predicates of *vaccine* in the corpus collected from the articles from May 2020. The size of the circle represents the frequency of the word in the corpus.

The words *available*, *safe* and *ready* are most commonly used together with *vaccine* in May 2020. The word *safe* was used ten times together with the word *vaccine*. Half of those sentences are in the context where tests and research are conducted in order to see if the vaccine is safe. The other half assures the readers that the vaccines are safe. Assuring people of the safety of a vaccine should be done by providing facts and proper arguments to see if the safety is just an opinion or a fact. Three of the five articles that assured the readers the safety of the vaccines had links to actual facts originating from tests.

The word *available* was used 14 times when talking about a promising future with the help of vaccines and speculations of how the world would look like when the vaccines were already available. After spending the spring in lockdown, many companies suffered economic losses, which is why the availability of the vaccines makes them hopeful: “Income from ticket sales may suffer, it said, if audiences are reluctant to return before a vaccine is available”. The example suggests that the vaccine is being linked to the return to normal life and, through that, also greater economic prosperity.

However, the word *available* was also used to talk about the topic of rushing the vaccines in the following example: “President Trump doubled down on Friday on his promise to have a coronavirus vaccine available by the end of this year, betting that he can rally the pharmaceutical industry and the government to have one”. People who were exposed to a message saying President Trump *rushed* the approval of COVID-19 vaccines



showed an increase in vaccine resistance. (Liu, 2022) The purpose of the article might have been to show hope for the arrival of vaccines, but it might have had an opposite influence on the readers.

The word *ready* was used seven times together with the word *vaccine*. Two of the instances are assumptions of when the vaccine will be ready. The other sentences talk about a time when the vaccine is ready and what comes with it. As was described above, at the end of April 2020, Donald Trump launched Operation Warp Speed, an initiative to produce a vaccine for the coronavirus as quickly as possible. The frequency of the word *ready* may show the desire to reassure the reader that the arrival of the vaccines is imminent. We can see this in the following example: “After Mr. Trump said drug companies would make a coronavirus vaccine ready "soon," Dr. Fauci amended the president's timetable, giving a more accurate estimate of at least a year”. In addition, there are words like *first* and *effective*, both used three times together with the word *vaccine*. *First* implies that there will be more than one effective vaccine. *Effective* is used twice to stress that it will indeed work.



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**Figure 1.** Adjective predicates of *vaccine* in *The New York Times* articles from May 2020.

Figure 2 shows the adjective predicates of the word *vaccine* in May 2021. Most frequently used words together with *vaccine* at that time were *available*, *effective* and *safe*.

*Available* was used 44 times, out of which 11 instances described the different age groups that the vaccine was available to. This can be seen in the following example: “on Thursday, after the federal government recommended making the Pfizer-BioNTech vaccine available to those aged 12 to 15. The U.S. is the first in the world to launch a mass vaccination campaign for children”. Information like this is crucial, because it broadens the dimension of age groups, but it also stresses the fact that the vaccine will be there to a wide public, not just selected few.

*Effective* was used together with the word *vaccine* 27 times. 22 of those instances described situations where a vaccine was effective or even highly effective. Five times the vaccines were described to be “less effective”. For example, “But across the Bronx – which has the city's lowest vaccination rate – the news struck many as proof the current vaccines weren't so effective. People don't want Moderna because they say you're going to need a booster shot”. The story does not say that the vaccines do not work but that boosters might be needed – something that we know to have been true in retrospect. As mentioned earlier, using words like *effective* and *safe* should only be done together with factual information, to increase public trust. The word *safe* was used together with *vaccine* 24 times. Only once was it used to describe the vaccine as not safe when a person was verbalising their fears. In addition, words like *hesitant*, *more* and *mandatory* have been used together with the word *vaccine*.



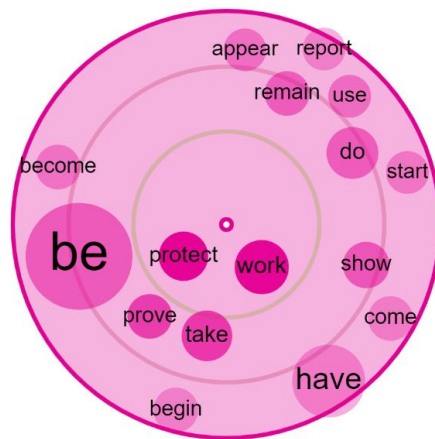
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**Figure 2.** Adjective predicates of *vaccine* in *The New York Times* articles from May 2021.

Both time periods share the frequency of adjective predicates *available*, *safe* and *effective*. The difference of the time periods can be seen in the use of the words *mandatory* and *hesitant*, used in 2021. These words have come from the fact that the vaccines were being distributed to people in 2021 and feelings of hesitancy increased. There was discussion on whether the vaccines should be made mandatory. The newspaper has taken an encouraging role while talking about the vaccines, which can be seen from the fact that most of the words in Figure 1 have a rather positive connotation and have facts to support them. The adjective predicates of *vaccine* are used in a rather positive light.

Another crucial component are verbs with *vaccine* as the subject. A subject is a part of a sentence, which contains the thing performing the action in a sentence. Figure 3 shows the verbs with *vaccine* as subject in May 2020. The most frequent are *be*, which can be seen in 113 instances, and *have*, which is used 35 times. These are frequent verbs in any context. Words like *become* and *begin* on Figure 3 provide insight into the time context of the vaccines – they were still only in development. Another instance where the importance of the specific time is seen is with the word *protect*. *Vaccines* are *protecting* “monkeys” in six out of the seven instances the word was used, because at the time, vaccines were being tested

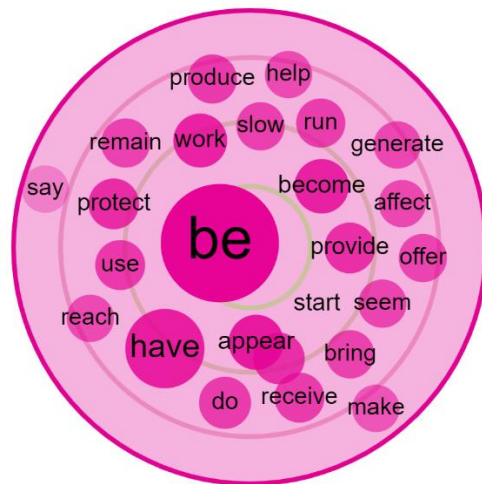
only on monkeys.



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**Figure 3.** Verbs with *vaccine* as subject in *The New York Times* articles from May 2020.

Figure 4 shows the verbs with *vaccine* as subject in *The New York Times* articles from May 2021. Similarly to May 2020, the most frequent verb is *be*, with 369 instances. *Affect* is an interesting verb which appears in the articles four times. *Vaccine* gets a negative connotation in the following example with the word *affect*, “Parents of adolescents I spoke to tended to be concerned about the vaccine affecting puberty and future fertility for their children”. Mentioning someone’s worries can have a bigger impact than expected and, instead of calming people, this usage can help to increase hesitancy. In eight cases, the vaccines are *protecting* someone like in the following example: “Coronavirus Vaccines Protect Pregnant Women, Another Study Suggests The shots may also have benefits for infants and do not seem to damage”. The verb *protect* stresses the positive aspect of vaccines, but the force of the very is softened by words like *seem* and *may also have*. This usage reflects the scientific habit of not making exaggerated claims, but it also can make some readers uncertain.

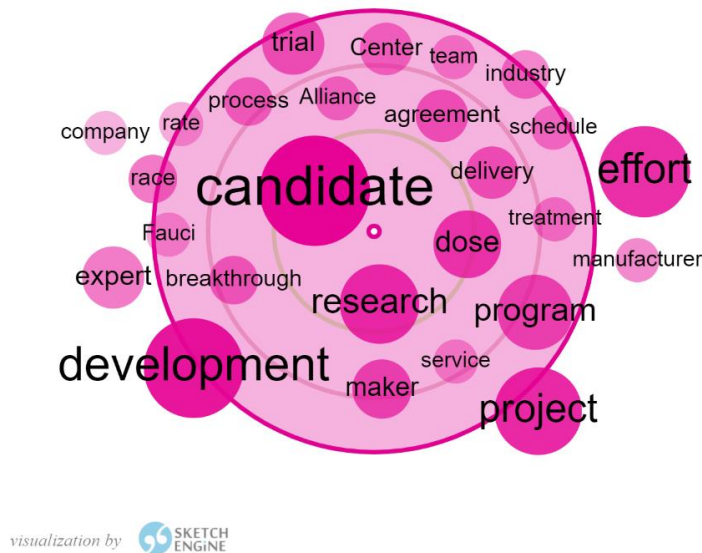


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**Figure 4.** Verbs with *vaccine* as subject in *The New York Times* articles from May 2021.

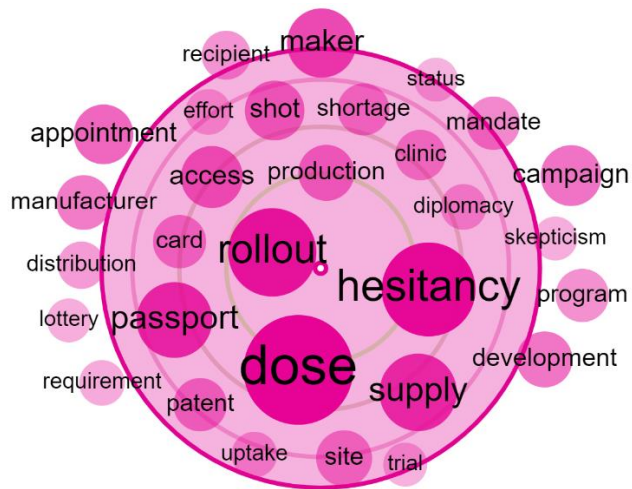
In both time periods the verbs *be*, *have*, *protect*, *become*, *work*, *do*, *start*, *use*, *remain* and *appear* are used. While in May 2020 only 16 verbs were used with *vaccine* as subject, in May 2021 there were already 24 different verbs, which shows that the topic of COVID-19 vaccines received more varied coverage in the news.

A modifier's task is to make a sentence more detailed and descriptive. When looking at nouns that are modified by *vaccine*, we can see the main themes in news at the time. Figure 5 shows the nouns that are modified by *vaccine* in *The New York Times* articles from May 2020. During May 2020, the main theme was the development of the vaccines as can be seen from the frequency of words like *candidate*, *development*, *effort*, *program*, *research* and *project*. Once again, the readers are reminded of how fast the vaccines are being produced by using the word *race* four times in one month. This can be seen in the following example: "It is a front-runner in the coronavirus vaccine race, and its stock has risen more than 250 percent since the beginning of the year". The example shows that vaccine development is compared to a race, which countries are trying to "win". However, it also stresses that there are many companies involved in the effort and this may have a reassuring effect on the readers.



**Figure 5.** Nouns modified by *vaccine* in *The New York Times* articles from May 2020.

In May 2021 the main topics are vaccine doses and hesitancy. Doses are mainly being talked about together with statistics. This can be seen in the following example: “About 47 percent of people in the United States have received at least one vaccine dose, and appointments are readily available across most of the country”. Vaccine hesitancy has been mentioned 59 times in May 2021. Hesitancy is something *to fight* and something that acts as *a roadblock*. The following example shows the use of the war image: “of low- and middle-income nations reported having plans to train enough vaccinators or campaigns in place to fight vaccine hesitancy”. In this example, hesitancy is seen as something that needs to be countered with a military campaign. It is also interesting that the newspaper talks about vaccine hesitancy, not anti-vaccine groups, to soften the image and thus to also make an effort to persuade the hesitant to get vaccinated. That is, the *New York Times* takes an active stance in support of vaccines and presents vaccine hesitancy as a public health threat.



visualization by  SKETCH ENGINE

**Figure 6.** Nouns modified by *vaccine* in *The New York Times* articles from May 2021.

May 2020 has 26 nouns modified by *vaccine*, whereas May 2021 has 30. This can be explained with the fact that during May 2021, COVID-19 vaccines had been available for the general public for 3-4 months, to give more time for instances of vaccine hesitancy to emerge and more discussion on the topic is generated. Both time periods show use of language that can strongly shape people's understanding of the vaccines, which can either lead to vaccine hesitancy or better perceptions of the vaccines. Using words like *rush* can make the readers distrust the vaccines, which might lead to vaccine hesitancy, which was a rather commonly used word in 2021.

## CONCLUSION

COVID-19 became a global pandemic and the political measures taken to mitigate the disease were rather polarising. Producing new vaccines in 2020 made this topic even more polarising, which is why vaccines started to dominate in media discourse. mRNA vaccines might have been seemingly new to the general public, but they were in fact already 30 years in the making. From the beginning of vaccine development in March, 2020 to the administration of vaccines to the general public in 2021, many opinions were formed.

As the literature review suggests, a common theme while talking about COVID-19 vaccines in media is the link between the news source and vaccine hesitancy, which according to Park et al (2021) and Melki et al (2021) plays a vital role in how people view vaccines. Media literacy also has a part in shaping the understanding of COVID-19 vaccines. According to WHO, three simple messages in media would be optimal, but different media outlets are trying to find their own ways of handling this topic.

The goal of this study was to see how *The New York Times* acts in an infodemic and how the ways of talking about COVID-19 vaccines change in time from May 2020 to May 2021. Two separate corpora were compiled to identify similarities and differences. The first corpus was compiled from *The New York Times* articles from May 2020 that mentioned COVID-19 vaccines. It consists of 968 288 words from 359 articles. The second corpus was compiled from *The New York Times* articles from May 2021 that mentioned COVID-19 vaccines. It consists of 769 991 words from 671 articles.

The corpora were analysed by using the Sketch Engine corpus tool. The findings show that while the adjective predicates of *vaccine* help to present vaccines in a positive light, nouns modified by *vaccine* show that the public's understanding of vaccines is perhaps indirectly also being pushed to a negative side. The corpus shows the use of the word *race* in the articles from May 2020. A study by Palm et al (2021) shows that people who are



exposed to a message saying President Trump *rushed* the approval of COVID-19 vaccines show an increase in vaccine resistance. *Race* can be seen as a way of rushing. In addition, in the articles from May 2021, hesitancy is being talked of negatively. Even if it is a tactic of emphasizing on morale, it should not occur in a newspaper like *The New York Times*. All of the other words that were mainly used together with the word *vaccine* show neutrality and can be explained in timely context.

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## RESÜMEE

TARTU ÜLIKOOL

ANGLISTIKA OSAKOND

**Anett Pettaig**

**Media Representation of COVID-19 Vaccines: Corpus-assisted Discourse Analysis of *The New York Times***

**COVID-19 vaktsiinide kujutamine meedias: korpusepõhine diskursuseuuring *The New York Timesi* artiklite põhjal**

Bakalaureusetöö

2023

Lehekülgede arv: 31

Annotatsioon:

COVID-19 pandeemia kujunes ühiskonda polariseerivaks teemaks, sest poliitilistel jõududel olid erinevad arusaamad sellest, mis meetmeid peaks haiguse leevendamiseks kasutama. Vaktsiinide väljatöötamine suurendas polariseeritust veelgi, mistõttu hakkas teema üle maailma meedias ja sotsiaalmeedias domineerima.

Bakalaureusetöös vaadeldakse traditsioonilise kvaliteetmeediaväljaande *The New York Timesi* artikleid, milles käsitletakse koroonavaktsiinide temaatikat. Bakalaureusetöö eesmärk on välja selgitada, kuidas kujundatakse lugejate arvamusi traditsioonilises kvaliteetmeedias, kus emotsionaalset alatooni ja eelarvamusi esineb vähe. Saadud tulemusi saab rakendada tulevikus paremate suhtlusstrateegiade loomisel.

Bakalaureusetöö koosneb sissejuhatuses, mis tutvustab COVID-19 vaktsiinide arendamise ajajoont USAs. Teoreetiline osa annab ülevaate meedia käsitlustest COVID-19 vaktsiinide teemal. Empiiriline osa koosneb *The New York Timesi* artiklitest koostatud korpuse analüüsist ja kokkuvõttest.

Kasutades korpusepõhist diskursuseanalüüsi selgus, et ajakirjanike teabe edastamine muutus ajas konkreetsemaks, kuid teatud sõnade kasutus nagu “kiirustama” võis ajalehe lugejate hoiakuid mõjutada.

Märksõnad: Inglise keel ja keeleteadus, korpusanalüüs, diskursusanalüüs, meediadiskursus, *The New York Times*, koroonaviirus

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