Good News – Bad News. Proportion between Positive and Negative Headlines in the Global News Feed (Based on the *Google News* Aggregator)

Iurii Melnyk[1], Andriy Melnyk[1], Yaryna Pryshliak[1], Olesia Melnyk[1], Anastasia Soroka[1], Viktoria Churevych[1], Rasha El-Ibiary[2], Delfina Ertanowska[3], Huayu Sun[4]

[1]The Department of Foreign Press and Information, Ivan Franko National University of Lviv, Ukraine

[2]The Department of Political Mass Media, Future University in Egypt, Egypt

[3]University of Information Technology and Management in Rzeszow, Poland

[4]The Department of Ukrainian Applied Linguistics, the Ivan Franko National University of Lviv, Ukraine

Correspondence: Iurii Melnyk, The Department of Foreign Press and Information, Ivan Franko National University of Lviv, Ukraine.

Abstract

This article tests the assertion about the dominance of the negative agenda in the media space. To this end, *Google News*, the world's largest news aggregator, was taken into account, on the basis of which the ratio of positive and negative news headlines in the information flow was analyzed. Three stages of research were conducted, each one week long with 16 country versions of *Google News*. In total, it was considered a little less than half a million news headlines. According to the results, 70.54% of the headlines turned out to be positive. This outcome questions the stereotype of the dominance of negative agendas in the global news stream. As it turned out, the ratio of positive and negative news depends on the language (versions of *Google News* in one language showed very similar results) and the day of the week (the news is a little more positive on Sundays), but does not depend on the level of freedom of speech, cultural and geographical factors.

Keywords: *Google News*, headlines, good news, bad news, positive news, negative news, negativity bias, positivity bias

1. Negativity Bias

The study of the emotional coloring of news content is based on the widespread conviction that mass media coverage of events is dominated by a negative tone. The phrase "Good news is the bad news", popular in the journalistic environment, seems to be confirmed not only by common sense and the complaints of influential intellectuals, but also by detailed data research. Kalev H. Leetaru (2011) analyzed the emotional tone of the news stories in *The New York Times* in 1945–2005 and the archive of translated articles and radio broadcasts from 130 countries in 1979–2010. By examining the number of words with positive and negative connotations in the texts, he found that the news is getting more and more gloomy.

The tendency to favor negative information over positive information is what psychologists call "negativity bias" (Vaish, Grossmann & Woodward, 2008). In the context of the media industry, it manifests itself in the fact that editors choose to cover, first of all, negative news (Miller & Albert, 2015; Kerbel, 2001). This has a significant impact on the perception of reality as a whole, as well as on its individual aspects. For example, negative coverage of political topics, especially elections, contributes to the perception of politics as a dirty game, as a result of which democratic governance suffers (Patterson, 1993; Soroka & McAdams, 2015). Michael Shermer (2018, p. 194–206), based on many empirical studies, identifies the reasons for the asymmetry of negative and positive information, amoung which psychological factors prevail.

The influence of negativity bias on the perception of reality has been the subject of significant amounts of popular research, including "The Good Angels of Our Nature" and "Enlightenment Now" by Steven Pinker (2011; 2018), "The Rational Optimist" by Matt Ridley (2010), "Progress" by Johan Norberg (2017), "Factfulness" by Hans Rosling, Anna Rönnlund Rosling, and Ola Rosling (2018), and many others. These works are united by the evidence-based assertion that human intuition, exacerbated by excessive media attention to negative news, prevents us from seeing clear progress in many areas of life.

2. Purpose of the Article and Hypotheses

The purpose of this article is to find out the proportion between positive and negative news headlines in the global media space. The above scientific studies support hypothesis #1: negative news headlines dominate positive ones.

In the framework of this study, we aim not only to find out this proportion, but also to consider the factors that influence it. The data obtained as a result of the research will make it possible to check the following parameters.

2.1 Correlation of the Proportion of Positive/Negative News and the Level of Democracy in a Country

It has been repeatedly noted in the scientific literature that in authoritarian and totalitarian societies there is a tendency to avoid the dissemination of negative information. A historical example is fascist Italy, under which the Ministry of Press and Propaganda (later the Ministry of Popular Culture) regulated the functioning of the media, sending instructions to the editors (the so-called "veline"). One of the directions of this policy was to limit the reporting of crimes, accidents, and anything that could undermine the image of "a perfect public order" in the country (Cassero, 2004, p. 129–146). In 1929, the director of *Il Resto del Carlino* Giorgio Pini in a letter named controversies, "crime news (passionate events, suicides)", "tragic and emotional news" among the topics forbidden for publication. therefore, it was increasingly difficult for his newspaper to survive (Forno, 2005, p. 127).

The tendency to hide negative information has also been adopted by modern non-democratic regimes. A good illustration is the study by Jason Q. Ng (2013), who, using a computer script, recorded thousands of words that were censored on the Chinese resource *Weibo*. From the list of banned words, it is easy to deduce content that the Chinese authorities consider objectionable. Along with predictable political topics ("flash mob", "May Fourth Movement", "Tibetan protest", "Operation Yellowbird", "Article 23", etc.), one can also see "The Great Flood of August 1975", "unnatural death", "massacre", "Sichuan earthquake", "Beijing Ferari car accident", and many other non-political topics.

In a similar style, in late 2019 and early 2020, the Chinese authorities kept silent about the Covid-19 epidemic until silence became impossible. As Lawrence (2020, p. 11) notes, during this period, the Chinese authorities were not only reluctant to provide complete information about the new disease, but also resorted to "official actions to discipline those who shared information about the epidemic publicly, as well as examples of censorship". Chang, Hobbs, Roberts, and Steinert-Threlkeld (2022), also write that PRC residents could not obtain sufficient information about the epidemic from official sources.

More broadly, Covid-19 is a litmus test for undemocratic, regulated media spaces: the more authoritarian the country, the more the authorities tried to hide information about the disease and mortality statistics (especially in the first months), to pretend that nothing was happening. This applies to Belarus, Russia (Åslund, 2020, p. 542), Nicaragua (Jarquín, 2022, p. 1) and others.

2.2 Correlation of the Proportion of Positive/Negative News and Cultural, Geographical, Linguistic Factors

There were a number of studies on the perception of negative news by recipients, both comparative and on the example of one country. In particular, Stuart Soroka, Patrick Fournier and Lilach Nir (2019) showed differences in the reaction to negative news in seventeen countries from all continents. As for the direct study and comparison of media content, not much has been done so far. A notable approach to this scientific problem is the study by Anju Grover Chaudhary, who attempts to compare the proportion of positive/negative news in the "West" and in the "Third World". The author sees the grounds for the existence of these differences in the different philosophies of news journalism: "Western journalists define news in terms of interest, proximity, prominence, conflict, novelty, human-interest, and timeliness", whereas "Third World journalists see news in an altogether different light. Their emphasis is on what news does rather than on what news is (…). The purpose of news in a majority of Third World countries is to educate the public and help in nation building (…) The emphasisis therefore on development, progress, and success" (Chaudhary. 2001, p. 28). The results did not confirm the hypothesis, there was no significant difference in the share of negative news in the "Third World" countries compared to "Western" countries. On the other hand, the sample was rather modest: "West" was represented by the *Washington Post* (US) and *The Times* (UK), the "Third World" was represented by the *Times of India* and *Daily Times* (Nigeria).

The language factor has been studied even less. One should note a significant bias in favor of English-language content in the studies. Duval and Pétry (2016, p. 198) point out that "despite the growing importance of research on the negativity bias of political texts in English, very few researchers have taken an interest in the analysis of political texts in French."

All this makes it appropriate to conduct a comparative study of the share of positive/negative news on a wider range of material that would reflect the cultural, geographical, and linguistic diversity of the global information space as fully as possible. For instance, we believe that the above mentioned Chaudhary's hypothesis from 2001 about negativity bias as a phenomenon more typical of the "Western" countries compared to the rest of the world needs further verification.

2.3 Differences in Proportion Between Positive/Negative News According to Days of the Week

In this regard, it is appropriate to single out one special category of the press, namely the Sunday press, which has been for a long time a special phenomenon in the media. A British newspaper editor and author Robert Donald in 1890 described in detail the features of the Sunday press, in particular: "Editors concentrate their best efforts on the Sunday issue, and advertisers give it the most patronage (…) If they secure an exclusive interview with an important character, it is reserved for the Sunday issue. If they have 'scooped' a rival over a local sensation, it is used to 'boom' the Sunday paper. If they investigate some public scandal, portray the career of a notorious criminal, unearth a piece of political roguery, the 'stories' are held over for the Sunday editions" (Donald, 1890, p. 78–79).

The Sunday press appeared at the end of the 1700s in the UK and in the first decades of the 1800s in the USA. Joseph Pulitzer, among many others, "promoted the Sunday edition as an entertaining diorama" (Moore & Gabriele, 2022). Martin Conboy (2004, p. 154–55) in connection with the content of Sunday papers mentions "criminal papers and scandal sheets", "sensationalist ingredients", "escapism and prurience", "mixture of court reporting (…) with political analysis", "sex, sensation and sport, intermingled with a wide range of the news of the week from home and abroad", "the best combined entertainment with political information and polemic", etc.

At the initial stage of development, religious organizations viewed the Sunday press as a serious competitor. One of the numerous examples of protests against the Sunday press from religious perspective for excessive attention to "perishing objects" is the book by J. Poynder (1820, p. 53). Reverend David James Burrell, who taught at the Princeton Theological Seminary, in 1896 analyzed eight Sunday newspapers, classifying the content by topic:

1. *Crime*: murders and assaults, adulteries, thefts – *43 columns*;

2. *Gossip (mostly disreputable)*: sporting, theatrical, gossip and fashion, sensational, fiction unclean personals – *351 columns*;

3. *(Chiefly) news and politics*: foreign news, political news, other miscellaneous news, editorial, specials, art and literature, religious. – *517¼ columns* (Ferre, 1993, p. 15).

In the context of our study, it should be noted that in Burrell's classification, content from the first category mostly falls under negative news (4.7% of content), from the second mostly falls under positive news (significantly more, 38.5% of content), and in the third category, positive and negative news are equally likely.

During the 20th century, the Sunday press evolved only in the direction of adaptation to the "new leisure", which includes television, travel, vacations, and other home and family oriented activities. A study of thirteen US Sunday editions by William A. Hachten (1961) recorded an increase in popular entertainment (almost doubled) and a slight decrease in serious arts during 1939–1959.

The current Sunday media stem from these traditions, so researchers mention its entertainment function more often than any other: the sports sections as "a weekend leisure activity" (Godoy-Pressland 2014, p. 149), readers' expectations about Sunday as a day "to relax while reading" (Lischka 2009, p. 2), "newspaper reading as a form of weekend entertainment and relaxation" (Tomczyszyn, Błaszczak 2015, p. 43). Anna Passera (2007) expressed the following about the peculiarities of the Sunday press in Switzerland: "Thus, in addition to the news, room was made for more in-depth articles to be read calmly lying on the couch, for investigative journalism, but also for more frivolous texts. Something to please all kinds of readers. Sensational items abound."

Based on the above, it is logical to assume that the practice of giving more preference to recreational content on Sunday contributes to a higher share of positive news on this particular day compared to other days of the week.

Thus, within the framework of this study, we propose three additional hypotheses:

#2: The more democratic a country is, the greater the share of negative news in its information space;

#3: The share of negative news depends on geographical, cultural, linguistic factors. For example, it is higher in Western countries compared to non-Western countries;

#4: The proportion of negative news is lower on Sundays compared to other days of the week.

3. Novelty

The novelty of the study lies in the fact that within its framework for the first time:

• It will be taken into account the news aggregator *Google News* as the most universal media resource, convenient for tracking the issues raised in the article;

• It will be comprehensively studied the proportions of positive/negative news in the world using the example of sixteen countries selected on the basis of the representation of the geographical, cultural, political, linguistic diversity of the world;

• It will be tested the dependence of the proportion of positive/negative news on such factors as the level of democracy, cultural, geographical, linguistic features, as well as the day of the week.

4. Methodology

4.1 Google News

News headlines published by the news aggregator *Google News* were chosen as the research material (we accept as an axiom that the tonality of a headline reflects the tonality of the content of a news story). The choice is dictated by the fact that this is the most popular news aggregator in the world, available in 35 language versions, which provides news from over 20,000 publishers globally. Consequently, there is no better media resource than *Google News* for this research.

4.2 Sample

In order to study the ratio of positive and negative headlines in global information flows as comprehensively as possible, we considered sixteen national versions of *Google News*. The following parameters were used in process of selection:

1. Availability of a country-specific version of *Google News*. As for 2021, *Google News* was available in 82 national versions. For example, the Arabic version exists for Saudi Arabia, Egypt, the UAE, and Lebanon, but does not exist for eighteen other Arabic-speaking countries.

2. The level of freedom of speech. The study considers countries with different levels of freedom of speech. To ensure this parameter, the 2020 World Press Freedom Index published by Reporters Without Borders was taken as a basis. This rating characterizes the situation with media freedom in 180 countries around the world, marking it with the markers "good", "satisfactory", "problematic", "difficult" or "very serious". All five categories are proportionally represented in our study.

3. Cultural and geographical factors. The study considers the Arab world (two countries) and – more broadly – the Muslim world (plus one country), Latin America (two countries), the Anglo-Saxon world (two countries), the Far East (two countries), sub-Saharan Africa (two countries), European Union (three countries), post-Soviet space (two countries). The article presents 16 versions of the news aggregator in 10 languages: English (five countries), Spanish (two), Arabic (two), Chinese, German, Italian, French, Russian, Ukrainian, Polish (one language each).

Thus, from each of the five levels of freedom of speech, an approximately equal (but at least two) number of countries was selected, as well as 2-3 countries per region (see table 1).

Table 1. The countries selected for the study

		Freedom of speech				
		"good" (2 out of 14 countries, 14%)	**"satisfactory"** (3 out of 33 countries, 9%)	**"problematic"** (5 out of 63 countries, 8%)	**"difficult"** (4 out of 47 countries, 9%)	**"very serious"** (2 out of 23 countries, 9%)
Cultural-geographical region	**Muslim world**			Lebanon	Pakistan	Egypt
	Latin America			Argentina	Colombia	
	Anglo-Saxon world	New Zealand	United States			
	Far East				The Philippines	China
	Sub-Saharan Africa		Senegal	Kenya		
	European Union	Germany	Italy	Poland		
	Post-Soviet space			Ukraine	Russia	

It is notable that the country versions of *Google News* are far from always being limited to news from the respective countries. Six English-language, two Arabic-language and two Spanish-language versions are closely intertwined, in Senegal most of the headlines come from France, etc. These facts have been ignored because the study focuses on what kind of news headlines appears on the feed of a resident of Kenya, Colombia or the Philippines, rather than where the news comes from.

4.3 Keywords

One cannot apply the positivity/negativity criteria to all the headlines. Accordingly, we faced the challenge of selecting methodological tools that would make it possible to distinguish positive news from negative news, and both the former

and the latter from those that do not lend themselves to such a binary classification. The most obvious way to identify news headlines in the *Google News* aggregator that fit the definition of "positive"/"negative" is to use keywords.

The studies which in one way or another formulated keywords as markers of positive/negative information were reviewed (in particular, see Rozin, Berman, & Royzman, 2010; Turney & Littman, 2003). When choosing keywords for research, we were guided by the following parameters:

- Words that are clearly expressed markers of positive/negative news;

- Words that are equivalent antonyms (for example, Rozin et al., 2010, noted that there is not one obvious antonym for the word "sincere" among the keywords selected for analysis);

- Words typical of news headlines (often used in journalism);

- Words that are universal enough to have the closest equivalents in all the languages included in the study;

- Different parts of speech (however, with a greater share of adjectives as the most characteristic markers of positive/negative information);

- It was also decided to limit the number of words (up to ten pairs) so that it would be possible to focus in more detail on the analysis of the results obtained for each of them.

As a result of applying the above criteria, the list of twenty keywords was formed:

good – bad;

better – worse;

positive – negative;

wonderful – terrible;

optimistic – pessimistic;

improve – worsen;

success – failure;

development – decline;

approve – reject;

safety – danger.

During 2021 three stages of research were conducted, each of which lasted one week: February 1–7, May 1–7, August 1–7. Within each of the three stages, all news headlines containing one of 20 keywords were taken into account. In the first stage (February 1–7), only the initial forms of twenty keywords were taken into account; in the second and third stages, all the word forms were also used in accordance with the grammar of a particular language: number and case of a noun; person, number, tense, person, gerund form for a verb; person, gender, degree of comparison for an adjective, etc.). Due to this, for example, in case of the Polish *Google News*, along with **dobry** ("good"), the authors also used **dobra**, **dobre**, **dobry**, **dobrego**, **dobrej**, **dobrych**, **dobremu**, **dobrym**, **dobrą**, **dobrymi**; along with **odrzucać** ("to reject") – **odrzucam**, **odrzucisz**, **odrzucałaś** and 37 more forms of this verb. In general, according to the specifics of each language, the number of keywords together with word forms for the Polish-language *Google News* increased from 20 to 384, for the Arabic-language up to 163, for the French-language up to 116, for the English-language up to 36, and for the Chinese-language it remained unchanged.

The first stage involved manual counting of headlines, the second and third stages were carried out using a specially written script. As part of the May and August stages, the script made the request to the *Google News* software interface twice a day for seven days. The script searched for news headlines containing one of the twenty keywords for each of the 16 countries, downloaded and distributed them into tables.

The timing of all three stages of research was decided in advance (the first seven days of the second, fifth and eighth month of the year). The period under observation included both local events, such as protests against tax reform in Colombia, and global events, such as the Summer Olympics. But above all the Covid pandemic stretched over all the three stages of research: new strains, infection numbers, vaccination and all the accompanying processes framed in the news headlines alarmingly, encouragingly, neutrally (but in a more balanced way compared to the first weeks of the pandemic). These circumstances do not prevent us from asserting that the period selected for the study is typical and represents the general situation.

5. Results Processing

Since the presence of one of the twenty keywords does not always mean the positive / negative nature of a news headline, the obtained results were filtered according to the following principles:

1. The news headlines that formally contained a positive (negative) keyword, but at the same time were not positive (negative) were sorted out. **Development** is a positive keyword (as opposed to **decline**), but when used in the phrase "the development of the pandemic", "the development of diabetes", etc., it loses its positive connotation:

- "Survey: How people from the region see the **development** of the pandemic" (Main Echo, Germany, 04.08).
- "Sohu: Regular skipping breakfast increases risk of diabetes **development**" (FAN, Russia, 01.08).

Similarly, negation ("not good", "not bad") at the level of meaning ("decline of criminality", "small security") of a positive/negative keyword deprives a headline of a positive/negative tonality:

- "Staying up all night and having fun? Why do we not sleep **good**? (Xinhua, China, 07.02);
- "Japan's PM was too **optimistic** about the course of the vaccination campaign" (Sumikai, Japan, 04.08).
- "Simona Ventura, football and TV: «**Failures** helped me»" (GameGurus, Italy, 01.08).
- "Knowing the **danger** helps to avoid danger when the Spring Festival is approaching! There are hidden dangers on roads, be careful while driving" (Finance.sina, China, 07.02).
- "John and Deborah Landis: «Nobody liked our **best** film. But why?»" (Corriere della Sera, Italy, 01.08).
- "The Olympics killed a **wonderful** horse: photo of a stallion that was euthanized in Tokyo" (MK Sport, Russia, 03.08).
- "Hope for an unemployment **decline** in summer" (Neue Westfälische, Germany, 02.05).
- "Consequences of the Kharkiv tragedy: the State Emergency Service conducts unexpected inspections to check fire **safety**" (TSN, Ukraine, 01.02).

2. The contradictive headlines that combined a positive message with a negative one were sorted out:

- "An app for young traders: the **development** and **decline** of Robinhood" (Trend online, Italy, 05.02);
- "The **good**, the **bad** and the ugly of the 2021 Golden Globes nominations" (Vanguardia, Spain, 04.02);
- "Is social media **good** or **bad** for mental health?" (The Straits Times, Singapore, 01.08).

3. Accidental results were sorted out, which are the headlines with the keywords used outside of the expected context. In particular:

3.1. Proper names, which coincidentally contain a keyword:

- "Río **Bueno**: vaccination for Covid-19 will be at home for people over 70 years old" (Diario Futrono, Colombia, 01.02) (Note 1);
- "New Original Soundtrack Album "**Breakdown** 3" Coming Soon" (Sohu, China, 07.02) (Note 2);
- "Marina Gouagnon (President of "**Bon** Samaritain"): «Our mission, to ensure the well-being and training of disadvantaged young people»" (FratMat, Côte d'Ivoire, 01.02) (Note 3);
- "Stars in the Saturday episode of «Dzień **Dobry** TVN»: Maria Sadowska, Filip Chajzer, Małgorzata Ohme" (Jastrzab Post, Poland, 06.02) (Note 4);
- "Media group «Patriot» and «**Khoroshie** novosti» of the Chelyabinsk region announced cooperation" (Tvolk, Russia, 04.08) (Note 5).

3.2. Other coincidences with the keywords due to homonymy and polysemy:

- "Luigi Pelazza, the journalist of Le Iene condemned: what **happened**" (Vesuvius, Italy, 02.02) (Note 6);
- "Irina Baeva collapsed when she remembered how her story began with Gabriel Soto: «**Maybe** it was a mistake that I paid dearly for»" (Titulos, Argentina, 01.02) (Note 7);
- "People may become less likely to contribute to a virtual public **good** like Waze if they know many others are already doing it" (The Conversation, Australia, 01.02) (Note 8).

3.3. A large number of headlines with keywords used out of context are headlines on the topic of Covid-19, since in the context of the pandemic very often "positive" and "negative" were used in relation to the results of Covid tests, and a "positive" test for Covid-19 was usually negative news and vice versa:

- "**Negative** anti-COVID-19 tests, no positives in Bitonto house" (US Bitonto Calcio Italy, 07.05).
- "Slovak authorities seal off Roma settlement after a quarter test **positive** for COVID" (Reuters, 05.02).
- "New rules for entering the Czech Republic. Only necessary arrivals and with **negative** test result" (Gazeta Prawna, Poland, 05.02).
- "Players return **negative** COVID-19 tests as Australian Open draw revealed" (Inside the Games, UK, 05.02).

However, not all the headlines about Covid-19 with the keyword "positive" were sorted out :

- "**Positive** feedback on Covid early warning system in schools" (Salzburg.ORF, Austria, 04.08).

4. Use of keywords in an ironic sense:

- Another "**success**" Blizzard – Diablo Immortal will not be released in 2021 (IA REGNUM, Russia, 04.08).

All the sorting out was done manually. The results cleaned in this way formed statistical material that enabled further analysis.

6. Findings

The total number of news headlines in the three-week study of sixteen countries are a little less than half a million (461,816). Of these, 77,681 (16.82%), were sorted out for the aforementioned reasons. In different countries, the share of sorted out headlines is different: the maximum percentage is in the case of Italy (41.59%), the minimum is in the case of China (4.74%).

The total number of positive headlines is 270,959 (70.54%), the negative ones is 113,176 (29.46%). It is important to note that within the framework of 48 week-long research (3 stages of research with each of the 16 countries), in all cases without exception, positive headlines quantitatively dominated negative headlines. Sometimes this advantage was minimal: Lebanon in August had 50.58% positive news. The maximum indicator was for Russia in August: 89.03%.

6.1 Comparison of the Results of the Three Stages

Checking the correlation of the results of the three stages (February 1–7, May 1–7 and August 1–7, 2021) is important as a test for the objectivity of this study: it is obvious that the closer the results of the stages are to each other, the bigger the scientific value of the study as a whole. One can make this comparison according to several parameters.

1. First, in terms of the share of positive news in each country. Since the February stage had its own features mentioned above, it is more correct to compare not the absolute indicators, but the relative ones, that is, not the total number of positive / negative headlines per country, but the share of positive headlines, expressed as a percentage. Figure 1 illustrates this indicator in each of the three stages of research.
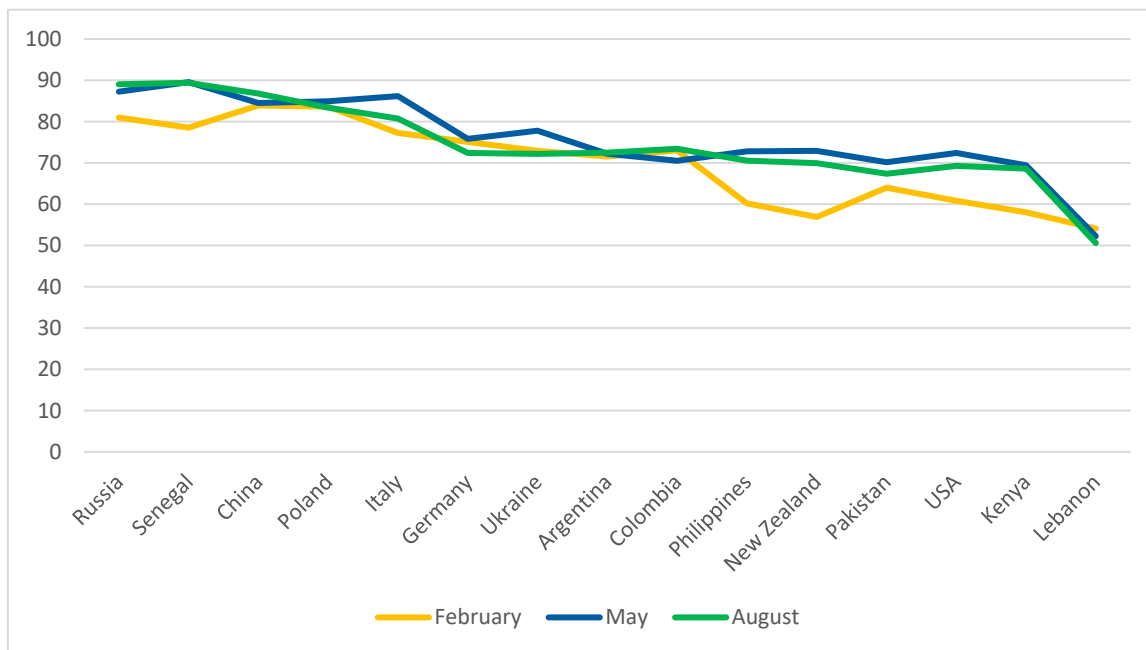

Figure 1. Share of positive headlines, %

The difference between the highest and the lowest rates is minimal in the case of Argentina (0.93%), Egypt (1.5%), Poland (1.56%), China (2.88%), Colombia (2.92%), Germany (3.41%), Lebanon (3.52%). The difference is still rather insignificant in the cases of Ukraine (5.61%), Pakistan (6.15%), Russia (8.05%), Italy (8.91%). It is slightly higher in the cases of Senegal (11.01%), Kenya (11.42%), the USA (11.61%) and the Philippines (12.63%). The maximum discrepancy is indicated in the case of New Zealand, where in February the share of positive news was 56.9%, in May it was 72.94%, and in August it was 69.94%. Thus, due to the low February indicator, the difference between the minimum and maximum shares was 16.04%. If we do not go into details, all three lines pass quite close to each other, which testifies the non-random nature of the obtained results.

2. Another perspective from which the results of the three stages can be compared is the ratio of the number of headlines with keywords within each of the ten antonymic pairs: the share of headlines with the word **good** in the antonymic pair **good – bad**, the share of headlines with the word **better** in the antonymic pair **better – worse**, etc. It makes sense to focus on the countries with the minimum and maximum difference in the results from the figure 1, that is, Argentina and New Zealand.
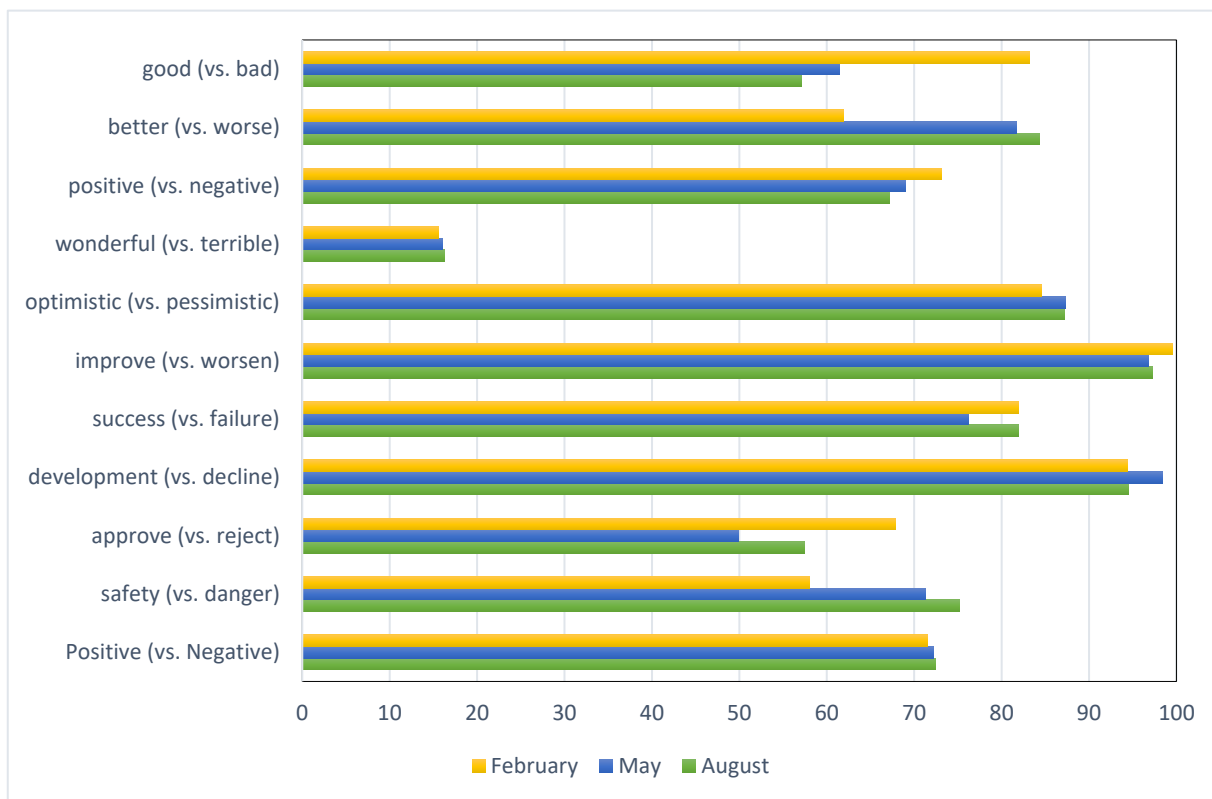

Figure 2. ARGENTINA The share of positive headlines, %

As can be seen from the Figure 2, in Argentina there is some fluctuation between the results of the three stages of research, although in most cases they are insignificant.

- The number of headlines with six positive keywords (**positive**, **wonderful**, **optimistic**, **improve**, **success**, **development**) varies by no more than 6%;
- With two keywords (**approve** and **safety**) it fluctuates between the February and May stages / February and August stages by no more than 20%;
- With two more positive keywords (**good** and **better**), the difference is 22% and 26%.
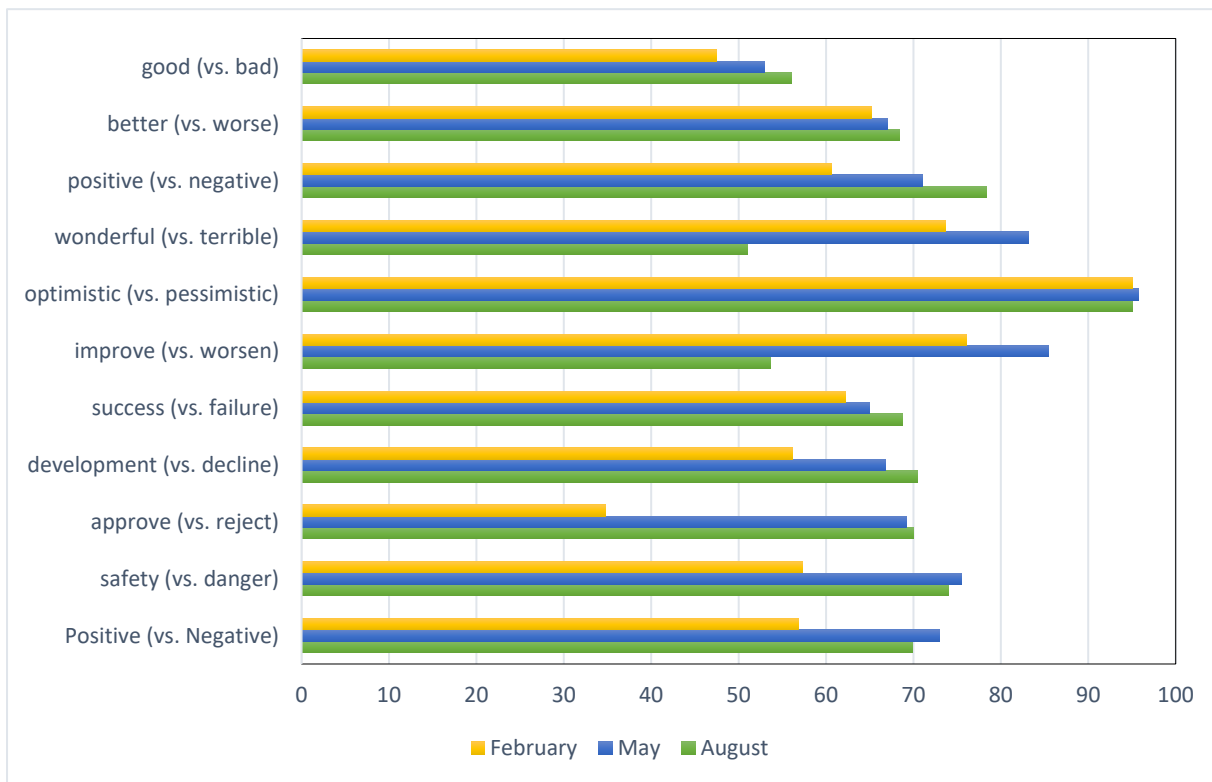
Figure 3. NEW ZEALAND The share of positive headlines, %

In the case of New Zealand (Figure 3), the discrepancy is bigger, but in most cases the difference is also not drastic:

- The number of headlines containing four positive keywords ("good", "better", "optimistic", "success") fluctuates by no more than 10%;

- With three keywords ("positive", "development", "safety") it varies by no more than 20%;

- With three more keywords ("wonderful", "improve", "approve") it fluctuates by more than 30%, which is a significant difference, but not so big that we can talk about an absence of a trend.

The Figure 4 illustrates the share of headlines with positive keywords in relation to their negative antonymic pairs in all sixteen countries.
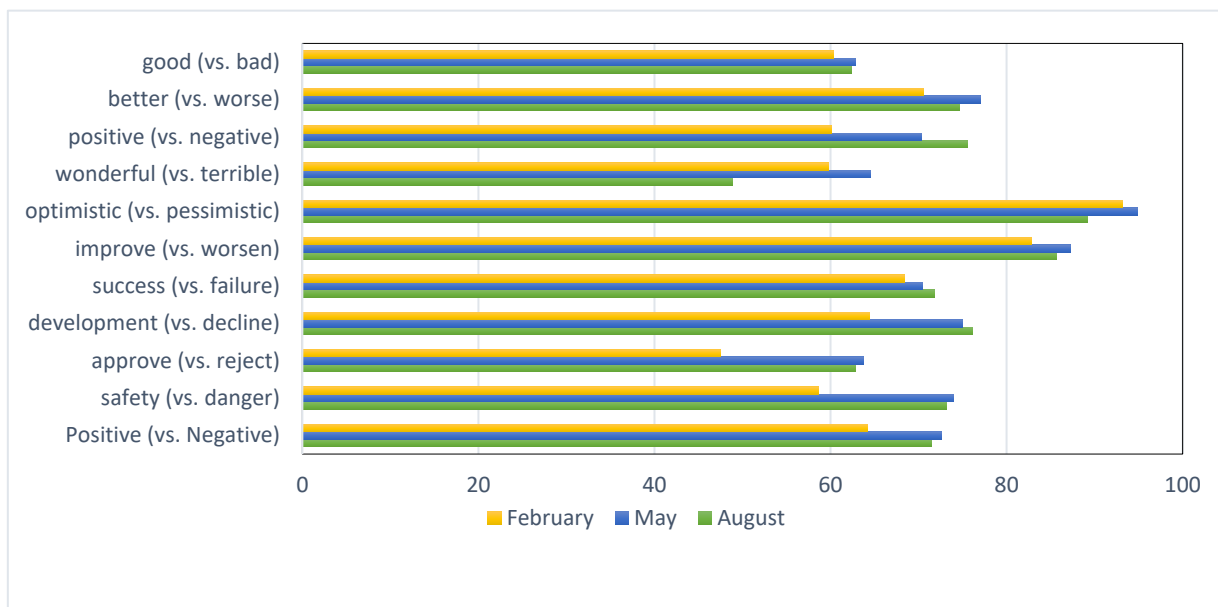
Figure 4. ALL COUNTRIES. The share of positive headlines in relation to the negative ones, %

The summed figures show even more consistency across the three stages than in either of the two countries analyzed above taken separately:

- The number of headlines containing five positive keywords ("good", "better", "optimistic", "improve", "success") fluctuates by no more than 7%;
- The number of headlines containing five other keywords fluctuates by no more than 17%. That is, out of ten pairs of keywords, there are no significant differences in any of them.

3. The third parameter that makes sense to check is the percentage of headlines sorted out in each stage of research. As already mentioned, the percentage is not stable from country to country and can vary by ten times: the number of sorted out headlines depends on accidents, such as homonymy or polysemy, which may be in one language and absent in another. However, if we consider a week-long stage of research (the total result of sixteen countries), then 16.1% of headlines were sorted in February, 21.62% in May, and 20.78% in August. As we can see, the fluctuations are insignificant.

The conducted analysis gives reason to assert that the differences between the results of the three week-long stages exist, but are hardly drastic, and therefore, *this study does not simply represent the news headlines in the national versions of Google News during three specific weeks, but can also claim to adequately reflect, more or less, the state of affairs in this news aggregator as a whole.*

6.2 The Findings by Keywords

As can be seen from Figure 5, in all ten antonymic pairs of keywords, positive words turned out to be more popular than negative ones. **Better**, **development**, **good**, and **improve** are the most frequently used keywords. The most popular negative word is **reject**. The least used keyword is **pessimistic**, with which we recorded only 531 news headlines. It sharply contrasts against the background of other keywords, even the negative ones.

The smallest advantage of a positive keyword over a negative one is in the case of **wonderful**/**terrible**, in the case of **good**/**bad**, and also in the case of **approve**/**reject** (about one and a half times). The biggest difference is in the case of **improve**/**worsen** (more than 6 times) and **optimistic**/**pessimistic** (more than 10 times). In all other antonymic pairs, positive keywords are 2–3 times more popular than negative ones (see Figure 5).
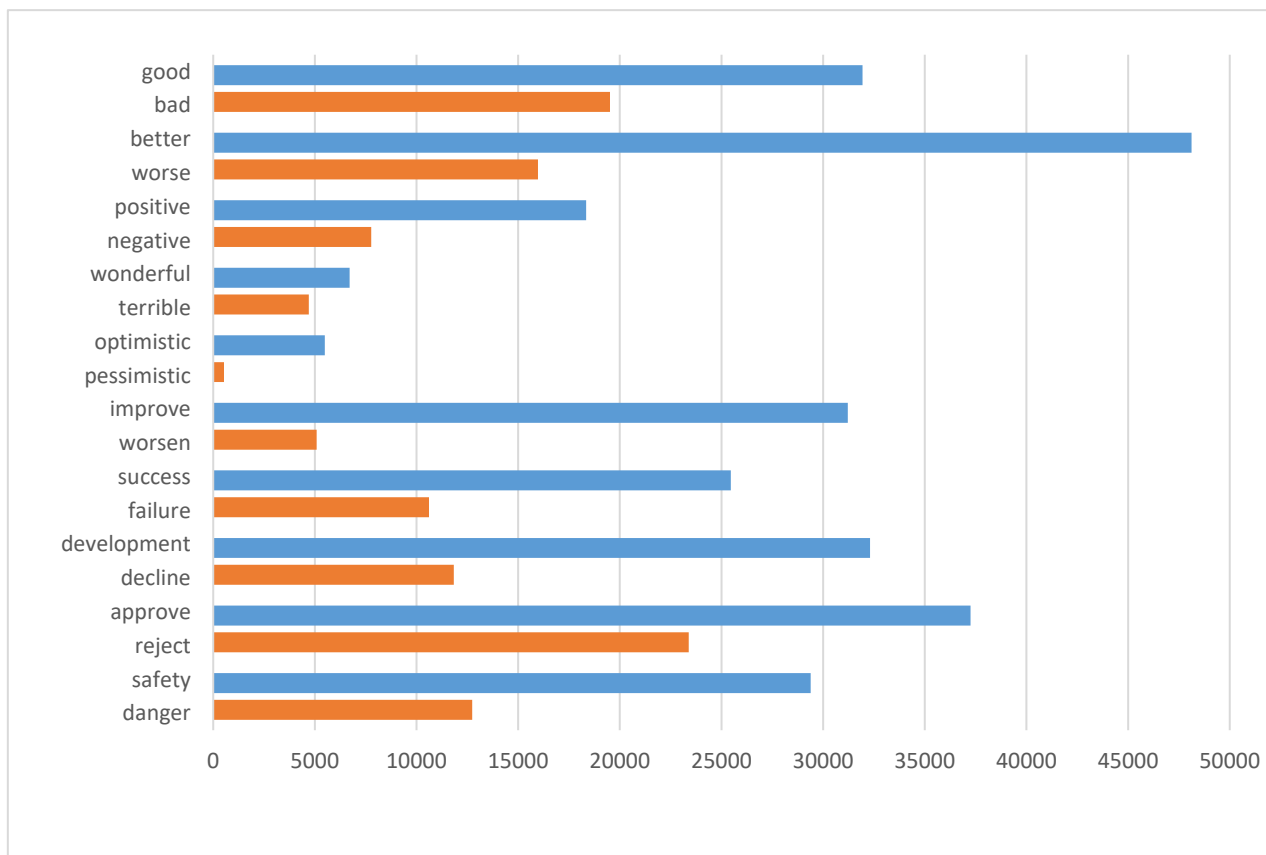

Figure 5. Number of headlines containing the keywords

6.3 Correlation of the Share of Positive News with the Degree of Freedom of Speech

In figure 6, we compared the percentage of positive headlines over the entire study period with the Reporters without Borders press freedom index. Russia occupies the first place in terms of the percentage of positive news. The countries in the top five are also Senegal, China, Poland and Italy. The countries with the fewest positive headlines are Pakistan, the US, Kenya, Lebanon and Egypt. The countries with the lowest level of freedom of speech, China and Egypt, are at opposite ends of the figure. There is no pattern in relation to countries with the highest level of freedom of speech – New Zealand and Germany. The Pearson's correlation coefficient between the PFI and the percentage of negative news is just 0.025. This figure is too low to indicate any connection between the level of freedom of speech in a country and the share of negative news.
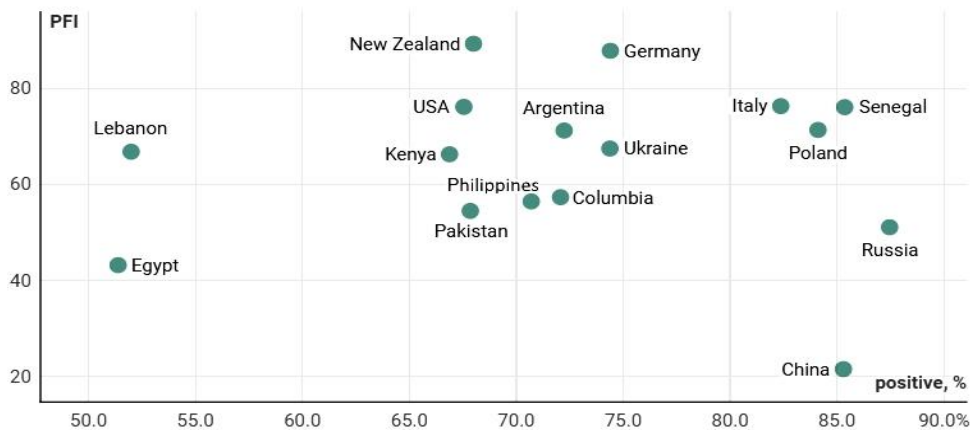

Figure 6. Correlation between the percentage of positive news and the Press Freedom Index

6.4 Cultural, Geographical and Linguistic Factors

Comparing the country versions of *Google News*, we see a clear consistency in the results in the countries with a common language: English-speaking, Spanish-speaking, Arabic-speaking. The fluctuations do not exceed 2.49% (between the Philippines and Kenya), and in most cases it is much less. This is easily explained by the interpenetration of the national versions, which share the same language.

The three Slavic countries, although they do not share a common information space, demonstrate partial consistency: the results of Poland and Russia are very close (83.97% and 85.75% of positive news, respectively), while Ukraine is slightly behind these figures (74.29%), but not so much as to be closer to Arabic-speaking or Spanish-speaking countries (see Figure 7).
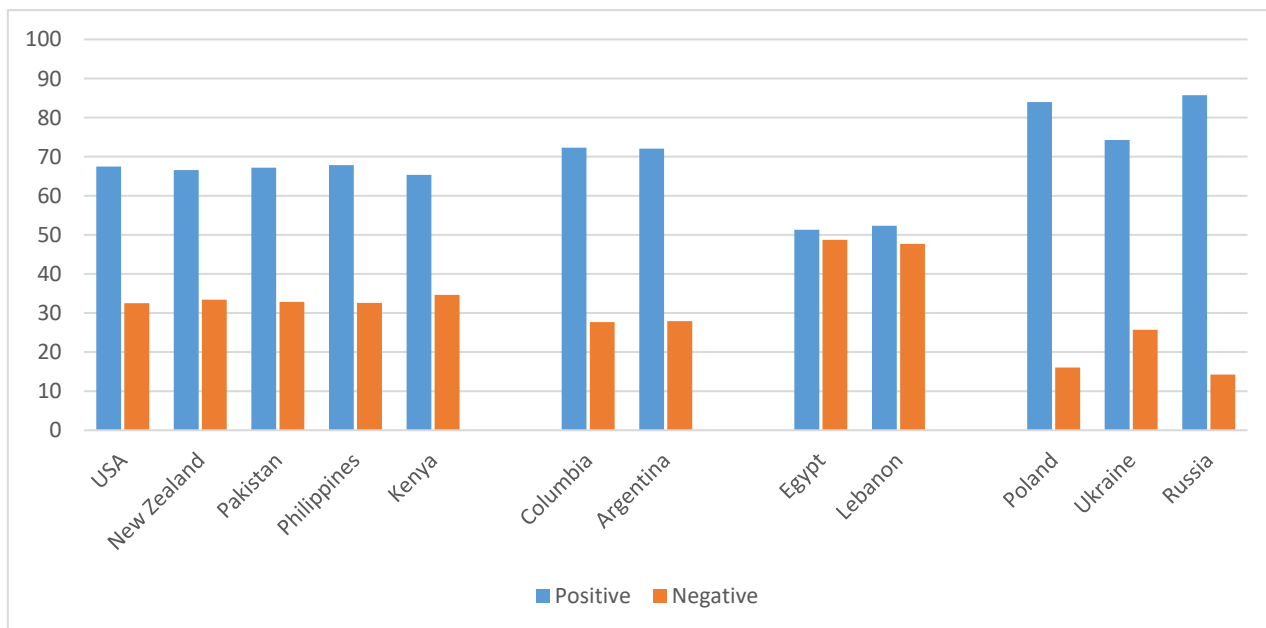

Figure 7. Positive / negative news headlines in English, Spanish, Arabic, Slavic speaking countries, %

If we take into account the cultural and geographical factor, then there is no consistency here. Where the language of a country version of *Google News* is not common – Africa, the Islamic world, East Asia, the European Union, the post-Soviet space (Russia and Ukraine were discussed above) – the percentage of positive news is largely different. (See Figure 8).
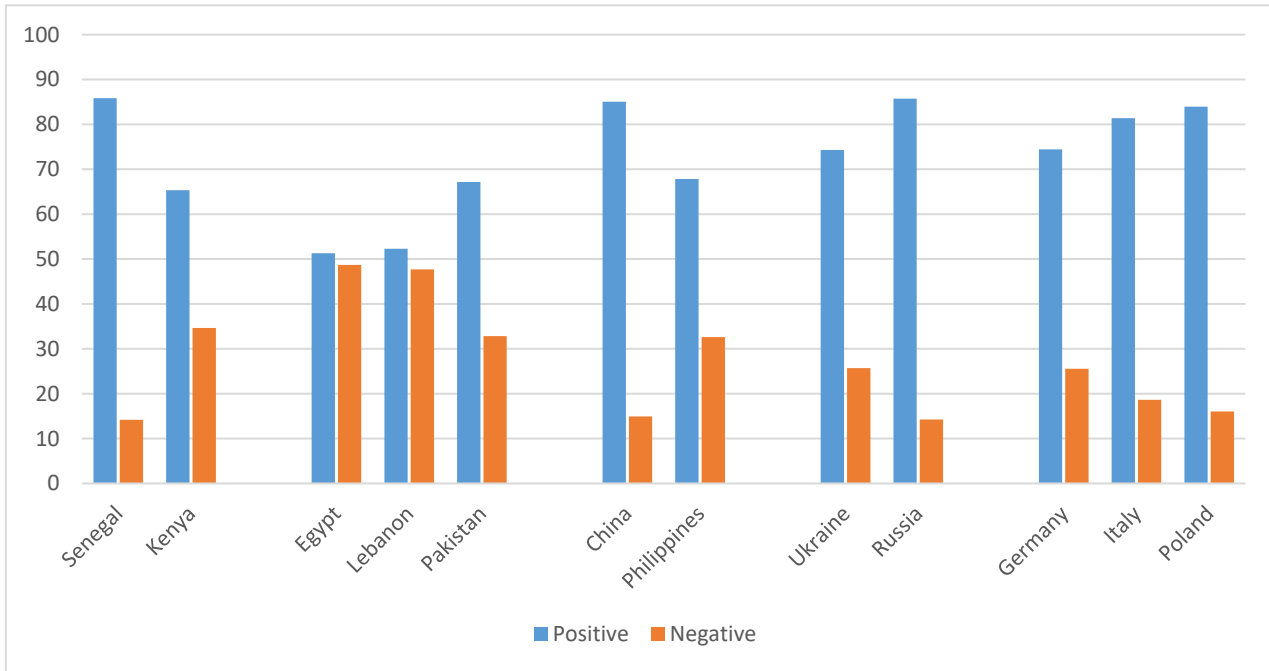

Figure 8. Positive / negative news headlines in Africa, Muslim world, Eastern Asia, post-Soviet space, EU, %

6.5 The Findings by Days of the Week

As it turned out, the most active media days are Wednesday and Thursday (more than 61 thousand news headlines). The least amount of news is on Sunday (about 40 thousand) and Saturday (48 thousand).
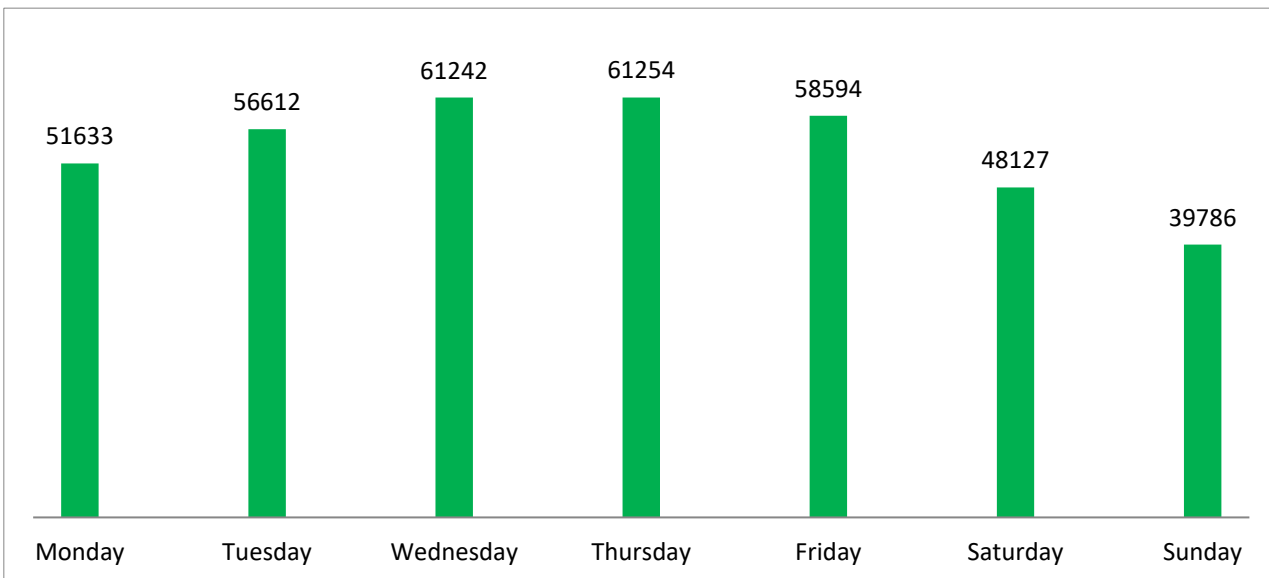

Figure 9. Number of headlines by day of the week

In general, from Monday to Wednesday/Thursday there is an increase in media activity, after which the amount of news gradually decreases. This order is typical of ten of the countries under research: Argentina, Germany, Italy, Kenya, Pakistan, Philippines, Poland, Senegal, Ukraine and the USA. In other countries, the situation is somewhat different. For example, in the case of China, the most significant downturn in the number of news headlines occurs on Saturday, not Sunday (although the general trend of decreasing media activity over the weekend is fully preserved). In Muslim countries – Egypt and Lebanon, but not in Pakistan – two lows are observed during the week, which is Friday in addition to Sunday.

It is noteworthy that, despite significant differences in the number of news headlines on some days of the week compared to others, the ratio between positive and negative news remains stable from Monday to Saturday (the fluctuation does not exceed 1%). Against this background, Sunday somewhat stands out, with 3.1–4.3% more positive news than on other days. Accordingly, there is less negative news (see Figure 10).
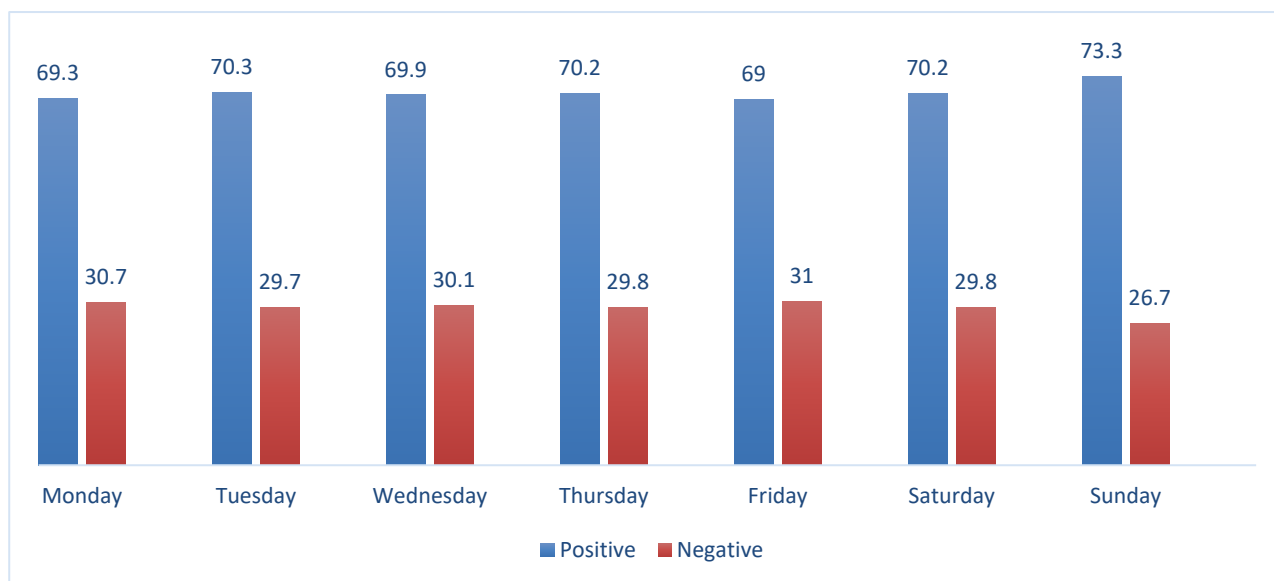

Figure 10. Ratio of positive and negative news, by days of the week, all countries, %

7. Coordination with the Results of Previous Studies

Since the total share of the positive headlines (70.54%) significantly predominates over the negative ones (18.82%), we encountered a discrepancy between our findings and the findings of previous researchers, who observed the dominance of the negative agenda. The explanation for this can be found in several perspectives:

7.1 Limitations of Methodology

The study has shown that the news headlines with the words **good**, **better**, **positive**, **optimistic**, etc. are significantly more numerous than **bad**, **worse**, **negative**, **pessimistic,** etc. These results hint at the conclusion that there are more positive headlines than negative ones, but the second is not an automatic and unconditional conclusion from the first. Here we may be dealing with the "Pollyanna hypothesis", the assumption expressed by Boucher and Osgood (1969), that there is a universal human tendency to use the positively colored words more often and more widely than the negatively colored words. A large-scale study conducted by a group of scientists based on ten languages demonstrated the advantage of positive vocabulary over negative or neutral (Dodds et al., 2015).

7.2 Framing of Certain Topics

Such areas as science, show business, culture, sports, certain areas of the economy (for example, construction) in the focus of the media have a positive connotation, given a certain stable tradition of reporting about such topics. For example, science news usually reports on achievements, whilst defeats and failures most often fade into the background. The news about culture mainly concerns exhibitions, festivals, concerts, ceremonies and awards – there is also relatively little room for negativity here. From here comes the corresponding emotional coloring and the dominance of positive keywords in the headlines:

- The American action film, which was filmed in Kyiv, topped the TOP-10 **best** films on Netflix ("Channel 5", Ukraine, 7.8.21);
- "President commissions **improved** Makuti-Chirundu Road section (The Herald, USA, 05.05.21);
- "Eutelsat Communications: **success** in the launch of the Eutelsat Quantum satellite" (Bourse Direct, France, 2.8.21);
- "The Ministry of Industry and Trade told about the measures taken for the **development** of electric transport in Russia" (Mukola.net, Russia, 7.8.21).

Zhang, Zhou, and Ebbers (2022) based on a study of the images of three countries, found out that in such topics as economic and technological development, firm attractiveness, it is even possible to talk about "positivity bias", that is, the tendency of information consumers to favor positive information over negative information.

Much less often, the media report on these topics in a negative way using negative keywords:

- "Letter: Facebook makes everything **worse**" (Times-News, US, 6.5.21);
- "769 Machine Translation Papers Show Automatic Evaluation **Worsening**" (Slator, Switzerland, 5.8.21);
- "NASA studies Mars rover sample collection **failure"** (CBS News, US, 7.8.21);

For sports news, which are a significant part of the news feed in all countries, positive framing is inherent. The very logic of sports is to celebrate the best (strongest, fastest, the most high-scoring). In the focus of the sports news, victories appear more often than defeats, the best ones and the champions are highlighted in media more often than the worst ones and losers. Accordingly, the news aggregator accumulates a lot more sports messages containing positive keywords:

- "Estimates of the game Shakhtar–Oleksandria. The **best**: Tsurikov, Miroshnychenko, Kovalets" (Sport.ua, Ukraine, 7.8.21);
- New decor of the tunnel at the Cracovia stadium. The players' **successes** have been immortalized (Dziennik Polski, Poland, 02.08.21).

Of course, there are also "bad news" among sports headlines, with an emphasis on defeats and failures, but these happen much less often:

- "Neymar, another Champions **failure**. The PSG paid him 366 million to never win it" (Corriere della Sera, Italy, 5.5.2021);
- "Mercato – OM: A huge **danger** is looming for Mandanda's successor!" (Le 10 Sport, France 4.5.2021).

7.3 The Content of Advertising Nature

Advertising carries almost 100% positive messages, because the point of advertising is precisely to evoke positive emotions with the advertised product. In particular, the promotional content is very popular with the words **better** and **best**. *Google News* publishes sponsored reviews, recommendations, ratings, in which it declares a certain product or service to be the "best":

- "Lidl: holiday appliances and accessories – the **best** deals" (PCWorld, Poland, 2.8.21);
- "The **best** 30 Mouse Bluetooth Mac for you" (Ufficio Spettacoli, Italy, 1.8.21).
- "**Best** smartphones under Rs 25,000 in August 2021: Mi 11 Lite and OnePlus Nord CE battle it out" (India Today, India, 2.8.21);

There is quite a lot of news of this nature. We calculated the percentage of purely advertising content with the words **better** and **best** in three country versions of *Google News* during one day (August 2). The share turned out to be quite stable: the USA – 20%, Kenya – 24%, Poland – 25%.

8. Conclusions

1. The results of the three stages of research turned out to be quite close. This proves that the obtained data are objective, and therefore have scientific value.

The study of almost half a million news headlines across 16 country versions of *Google News* found that 70.54% headlines are positive, 29.46% are negative. In each of the 48 week-long research studies (3 stages with each of the 16 country versions of the news aggregator), positive news headlines are more numerous than the negative ones. In each of the ten antonymic pairs, there are more news headlines with a positive keyword compared to the news headlines with a negative match. These results demonstrate a convincing dominance of positive news headlines over the negative ones. Hypothesis #1 was not confirmed.

2. The study of additional parameters provided the following results:

- There is no clear correlation between the level of freedom of speech in a country and the proportion of positive/negative news. If such a correlation exists, it is definitely not within the framework of *Google News*. Hypothesis #2 was not confirmed.
- The clear consistency of results was recorded between countries that share the same language. However, the level of freedom of speech as well as regional factors (belonging to Africa, the Islamic world, East Asia, the European Union, the post-Soviet space) in the absence of a common language do not have any noticeable weight. Hypothesis #3 was partially confirmed.
- Examination of the results of the study by day of the week showed that the ratio of positive / negative news from Monday to Saturday is stable (fluctuation does not exceed 1%). Only on Sunday there are 3.1–4.3% more positive news than on other days. Hypothesis #4 was confirmed.

3. An attempt to comprehend the obtained results, considering their fundamental difference from what was recorded by previous researchers, leads us to the following possible explanations:

- The "Pollyanna Hypothesis", the assumption that there is a universal human tendency to use positive words more often and more widely than negative ones;

- A tendency to frame certain topics – science, show business, culture, sports, certain areas of the economy (eg construction) – in a positive way;

- A significant part of the headlines of an advertising nature, in particular, using the keywords **better** and especially **best**.

4. The study showed the dominance of the headlines with the words **good**, **better**, **positive**, **optimistic,** etc. above the headings with the words **bad**, **worse**, **negative**, **pessimistic,** etc. These results hint at the conclusion that there are more positive headlines than the negative ones, but the second is not an automatic and unconditional conclusion from the first. Our study does not refute previous studies, just showing the other side of the same coin: even if bad news dominates the media space, it concerns certain areas (politics, economics, ecology, crime, etc.). In other areas – we named them above – the trend is opposite. In addition, advertising content, the extent of which can hardly be overestimated, consists almost entirely of positive messages.

5. It is not known exactly how the *Google News* algorithms work, this is a company secret. It's entirely possible that *Google News* chooses the news so that the good news outweighs the bad ones. Given the above, we associate ***the prospects for further research*** on this topic with the application of a similar methodology to other news aggregators and news resources. While there are no such studies, we can confidently talk about trends within *Google News*, and not about the media space as a whole. Our article has the modest merit of questioning the common stereotype of the dominance of a negative agenda in the global news stream.

Notes

Note 1. "Good" in Spanish.

Note 2. The album title "崩坏 3" contains the character "坏", which means "bad" in Chinese.

Note 3. "The Good Samaritan" in French.

Note 4. "Dzień Dobry TVN" – "Good Morning TVN" is the name of a Polish morning show that contains the keyword "good".

Note 5. "Хорошие новости" – "Good News" is the name of a Russian media project that contains the keyword "good".

Note 6. "Cos'è successo" means "what happened" in Italian, but "successo" is also "success", one of the 20 keywords.

Note 7. "A lo mejor" means "maybe" in Spanish, but "mejor" is also "better", one of the 20 keywords.

Note 8. "Good" used as a noun, has a different meaning than the adjective, so this headline was sorted out.

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