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Ukrainian Crisis on Twitter: Sentiment Analysis - Possible Interpretations¹

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Abstract

The mass use of social media has enabled users to reach out and share opinions, attitudes, and emotions on various topics - current events in particular - almost instantly. In this paper, we analyze the attitudes of Serbian speakers toward Russia and Russians during the ongoing war in Ukraine, based on the material obtained using an application for collecting and processing comments on Twitter. The study covers the period from February to September 2022. Starting with the assumption that Twitter users tend to be freer and more spontaneous in expressing their views compared to users of other social media (Facebook, Instagram, etc.), about 11,000 tweets were collected using the BigBoxData application based on keywords (Russia, Ukraine, war, special operation, Putin, Zelensky...), and were subsequently manually filtered and annotated. The goal was to find out if and how the attitudes of Serbian speakers toward Russia and Russians have changed with the ongoing war in Ukraine compared to associations and stereotypes toward Russia and Russians reported in previous papers. The combination of qualitative (positive, negative, and neutral sentiment) and quantitative (percentage share of each of the three sentiments) sentiment analysis showed that the attitudes of Serbian speakers toward Russia and Russians have changed compared to the previous period (using as a reference the Associative Dictionary of the Serbian language and the Reverse associative dictionary of the Serbian language, both of which report extremely positive associations). The methods used in this study and the research results can serve for further research and attitude change within the crisis discourse on social media and the Internet in general.

Keywords: crisis discourse, social media, stereotypes

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Introduction

The widespread use of social media has enabled users to express and disseminate their opinions, attitudes, and emotions on the widest possible range of topics, particularly regarding current events. Twitter, in particular, stands out for having served in recent times as a platform for both spontaneous and planned clashes among political figures, public personalities, and anonymous citizens (Zuckerman, 2013). In this regard, this social medium represents a valuable resource for studying the attitudes of Serbian language speakers on various current topics. After the coronavirus pandemic, a new major social crisis emerged: the war in Ukraine. In this paper, we analyze the attitudes of Serbian language speakers toward Russia and Russians during the war in Ukraine, based on the material collected through an application designed for gathering and processing comments on Twitter. In this study we have aimed to incorporate both a broader (global) and narrower (local, domestic) social context, while considering them in relation to the social and political activities in question, we consider critical discourse analysis to be a suitable framework for this type of investigation. Persuasive and manipulative objectives are often pursued by specific linguistic-stylistic means both in crisis discourse, and in the political discourse that invariably accompanies it. These objectives are achieved through word choice, word order, pronoun use, and employment of metaphors and metaphorical extensions, as already evidenced across materials in various languages and within diverse crisis corpora, such as the financial crisis (e.g., Silaški, Đurović 2011), the political crisis (Musolff 2016), the pandemic (Nikolić, Slijepčević 2022), and so forth.

It is important, moreover, to note that, in methodological terms, when applying sentiment analysis to tweets, numerous issues arise the specificity of which derives from the distinctive nature of the tweet itself: we are dealing with a very concise form (constrained by character count), frequently containing emoticons, often elicited by other tweets (a response to a preceding comment), and so forth.

The primary objective of this study is to examine whether the attitudes of Serbian language speakers toward Russia and Russians have changed compared to the period preceding the crisis. The secondary objective of the study is to explore the possibilities and limitations of sentiment analysis in discourse research on social media in the Serbian language. In this regard, attention was drawn to linguistic-stylistic means and linguistic procedures of distinctive function.

Serbian-Russian relations are traditionally considered friendly and warm. This is confirmed by research based on the Serbian language corpus, wherein the Russian stereotype is characterized as stable and positive, and based on tradition: “Mutual contacts and relations between Serbs and Russians are based on a common Slavic heritage and a shared Orthodox faith, reaching far into the past. More immediate connections were established in the late 17th, and the 18th century, following the great migrations of Serbs from Kosovo, Metohija, and North Macedonia” (Lazić Konjik, Ristić 2020: 164).

Starting from February 24, 2022, the armed forces of the Russian Federation have been conducting missile strikes on military targets within the territory of Ukraine, while ground forces have entered the Donbas region. Russia asserts that this is a special operation aiming at the denazification and demilitarization of Ukraine, as well as the protection of the residents of Donbas, whom Ukrainian authorities purportedly subjected to genocide for the past eight years. The Ukrainian government, on the other hand, views this as an act of aggression.

Initial media studies suggest that in their coverage of the war in Ukraine, the pro-regime media have aligned themselves with Russia, often attributing blame to the United States and NATO (e.g., CRTA, and later Drašković 2022: 189). These comparative analyses of informative broadcasts on the N1 and RTS TV stations conclude that the discourse is oriented toward assigning blame, singling out victims, characterization and the like, more so than toward information dissemination, thereby enabling manipulation, but it was not research of attitudes. Investigations into the attitudes of Serbian language speakers toward Russians based on cognitive ethnolinguistics, as illustrated by the works of I. Lazić Konjik and Stana Ristić, were considered as comparative elements for this type of analysis, along with associative fields from the Associative Dictionary of the Serbian Language. In connection with this aim, it was crucial to delineate the mechanisms and concepts that played a role in the formation of a positive or negative stance toward Russia and Russians.

The ethno-cognitive school equates the term “concept” with the notion of a stereotype and describes the stereotype of Russians in the Serbian language within this framework. However, seeing as we are reevaluating the existing stereotype in this study, we refer to a stereotype as a collective perception and understanding of phenomena within a socio-linguistic community (which is largely reflected in the vocabulary and phraseology). The term “concept” encompasses a representation that can be negatively or positively characterized but does not necessarily have to be stereotyped. The mechanisms involved in constructing a concept are common cognitive mechanisms: metaphor and metonymy, and often personification (according to the determinations of cognitive-linguistic schools).

Methodology

The study examines the period from the onset of the war in Ukraine, specifically from the end of February, to September 1, 2022. Proceeding from the assumption that Twitter users, given the choice to communicate under pseudonym if desired, tend to be more unrestrained and spontaneous in expressing their viewpoints compared to users of other social networks (Facebook, Instagram etc.), we employed the BigBoxData application to collect approximately 10,993 tweets based on keywords (Russia, Ukraine, war, special operation, Putin, Zelensky, Donbas). It is also worth noting that this analysis was conducted on a social medium known for often magnifying the negative side of things (Blazsetin 2022).

The researchers identify five phases of sentiment analysis (Lui 2012; Ivaninić 2021; Blazetin 2022), which we applied in the research:

1. Data Collection (raw, unstructured data);
2. Text Preparation and Pre-analysis Cleaning;
3. To establish categories, it is necessary to discard sentences that are objective and strictly informative, containing facts, and retain those expressing personal opinions, emotions, beliefs, etc.;
4. Assign categories to the extracted sentiment: positive, negative, neutral;
5. Present the results using graphs.

During the initial phase of the research, the BigBoxData application collected tweets. The keywords were searched for as hashtags as well as within the texts of the tweets. As certain words are visually similar across multiple languages, tweets from German, Albanian, Croatian, and even Hungarian-speaking regions were also gathered. The filtration process involved discarding comments that were collected by the algorithm but did not belong to the Serbian language, duplicate comments, as well as insufficiently informative ones or those not aligned with the research topic (e.g., “Vucic said PRIDE WON’T HAPPEN, even if Biden and Putin call him themselves; You will be responsible for War and Peace (I do not mean the readers’ section); I implore you, for God’s sake, do not turn to your people, I survived one war, enough for a thousand lifetimes, etc.”).

After the filtration process, 864 comments remained that correspond to the subject of our research (i.e., less than 10% usability).

Annotation was conducted on several levels: sentiment analysis, linguistic-stylistic means within microgenres, metaphorical scenarios (from a cognitive-linguistic perspective). The present study focuses on sentiment analysis. All tweets were annotated manually.

As established in the literature, sentiment analysis pertains to the study of opinions, attitudes, and emotions toward individuals, issues, events, and phenomena (Liu 2011: 474). In our study, sentiment is determined at the level of an individual tweet (comment), and the primary criterion is based on lexicon and pragmatics (word choice and contextual meaning). While categories of positive, negative, and neutral sentiment tend to be presented as distinct and well-defined in scholarly and scientific literature, in practice, there are often transitional categories between them, and their boundaries are fluid. Sentiments were classified based on the following discursive and linguistic-stylistic markers: lexicon type (for instance, negatively marked lexicon, swear words, and vulgar expressions reflecting a negative attitude toward Russia and the Russian people indicated negative sentiment), hyperbole, sarcasm, irony (depending on the target, whether directed toward Russia or Ukraine, also determined the type of sentiment), formulations of encouragement, cheering, support, admiration (likewise contingent on the recipient). In the following example, an ironic statement is made to the effect that Russia is the second strongest military power in Ukraine, preceded by a statement that positively portrays Russia as the second military power in the world. However, it remains unclear whether this irony

laments past times or acknowledges that the war in Ukraine is indicative of a new order that is better than the previous one: “Rusija je pre rata slovila za drugu vojnu silu u svetu i sada je je druga vojna sila ali u Ukrajini!” (Before this war, Russia was considered the second military power in the world, and it’s still the second military power, but in Ukraine!). With this in mind, we tried hard to assign only one sentiment category to each comment, based on the dominance criterion.

Results

Sentiment analysis on the collected and filtered corpus yielded the following distribution: 326 tweets were found to be positive (38.58%), 459 negative tweets, slightly more than half (54.32%), and 60 tweets showed neutral sentiment (only 7.10% of tweets). While negative sentiment dominates, we can conclude that this dominance is relatively weak.

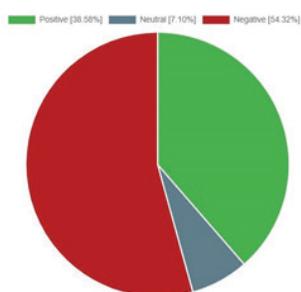


Figure 1: *Sentiment analysis*

Analysis

Our research of the Ukrainian crisis shows that the negative sentiment is constructed metonymically, mainly by equating Putin with the entire Russian people, as exemplified by statements like “Trenutno je najveći tiranin na svetu Putin i Rusija. Tačno zlu treba stati za vrat.” (Currently, Putin and Russia are the biggest tyrants in the world. Evil really does have to be trampled down.). Negative sentiment is also constructed by way of critiques of political decisions, such as “Pomalo neočekivan osvrt na kontekst u kojem je rusko društvo pripremano za ono što Putin danas definiše kao ‘vraćanje a ne otimanje’” (A somewhat unexpected commentary on the context during which Russian society was being prepared for what Putin today defines as ‘return rather than seizure’). It is furthermore fostered by suggesting consequences, as, for instance, in “Rusi su bedna stoka, Putin zvani ‘kepec’ ih je obrukao, da sledecih 200g. nece moci da operu ljagu sa sebe” (The Russians are miserable livestock, Putin ‘the dwarf’ has disgraced them so badly that they won’t be able to wash the dirt off of them for the next 200 years). Lastly, it is considered to be tied to the political situation in Serbia, which will be discussed in further detail later on.

Similar conceptual mechanisms are also employed in the case of positive sentiment: the exaltation and glorification typical of personality cult construction are

metaphorically extended to the entire Russian people metonymically. For instance, “kad Srbija stane na stranu Rusije pa Putin dodje i vrati sve Srpske zemlje pod okrilje Srbije, e pa dabogda se desilo nama.” (When Serbia stands with Russia, and Putin comes and returns all Serbian lands to Serbia, well, may God make that happen.) The concept of friendship is a traditional ethnic stereotype. Research indicates that various historical periods during which Serbia and Russia shared diplomatic, military, and especially cultural and religious ties have contributed to the formation of a positive Serbian stereotype about Russians as a fraternal and friendly people (Ristić, Konjik 2020: 165).

Neutral sentiment is characterized by attempts at objective observation, assumptions, and rhetorical questions, such as “Da li je moguća pobjeda jedne od strana?” (Is victory possible for either side?) // “Ako bi Rusija izgubila šta bi se desilo s njom.” (If Russia were to lose, what would happen to it?) // “Da se ne (za) varavamo ovo u Ukrajini je rat Rusije i NATO-a.” (Let’s not fool ourselves, the war in Ukraine is between Russia and NATO).

Discussion

When considering the positive associations from the associative fields of Moscow, Russians, and the Russian language in the Associative Dictionary of the Serbian Language, we can infer that the attitude of Serbian speakers has undergone a drastic transformation. The concepts of fraternal and friendly love, warm emotions, and closeness, based on Orthodox Christianity, were activated in the minds of Serbian speakers.

Moscow Russia 228; city 54; winter 48; Kremlin 42; snow 25; coldness 21; church, Red Square 16; vodka 15; cold 14; hotel 13; Russians, square 11; theater 10; Stalin 7; red, vodka 6; Orthodoxy, fig 5; communism, beauty, metro, Russian language, fur hat, size, desire 4; churches, capital city, KGB, ice, vastness, Putin...

Russians vodka 70; folk 50; brothers 36; Russia 28; Moscow 25; winter 22; people 14; Slavs 13; Siberia 12; friends 9; Orthodoxy 8; Serbs 7; language, Orthodox Christians, Russian language, great 6; red, communism, big 5; close, soul, cold, song, blues, blue, width, fur hat 4; good, spirituality, English, east, literature, Kremlin, nation, ours, friendship, strength, snow, USSR, Stalin, Ukrainians, army 3; brother, brotherhood, church, red, good people, state, communists, culture, love, mafiosi, mine, drink, drunkards, pride, friend, downfall, Prussians, Pushkin, rakia (brandy), Russian navy, alliance, power, poverty, steppe, fur hats, art, great people 2.

Even in the associative field of the Russian language we find the same positive associations such as brotherly, brothers, home, love and Orthodox.

The metaphor of kinship, especially brotherhood, is still a characteristic of public discourse when discussing international relations, and it also appears in this corpus for the relations between Ukraine, Russia, and America, where it is used to build a positive sentiment toward Russia: “Sta je to u glavi prosečnog Ukrajinca da misli i ubeđen je da mu je Amerikanac veći brat nego Rus?!” (What is in the mind of

an average Ukrainian that he thinks and believes that an American is a bigger brother to him than a Russian?!) // Predsednik Vladimir Putin je veliki prijatelj ove zemlje zahvaljujući kome ne mogu da nam otmu naše Kosovo i Metohiju i naravno da ga poštujem. Tačka. (President Vladimir Putin is a great friend to this country, thanks to whom they can't take away our Kosovo and Metohija, and so of course I respect him. Period).

The metaphor of friendship, however, has also been used in an ironic tone in instances of negative sentiment such as:

In the early 90s, the Russians incited our generals to war, then sold weapons to the Croats, and voted for sanctions against us, so yeah, we should trust such "friends."

A small number of associations from the Associative Dictionary of the Serbian Language, such as "power," "size," "military," "navy" speaks to the fact that speakers of the Serbian language have traditionally perceived Russians and Russia as socially and politically superior. In our corpus, certain positive sentiments have been built around this concept, glorifying Putin:

"Putin im je napravio najveći problem. Međutim s obzirom da su svi u Putinovom džepu, moraju da slušaju." (Putin has caused them their biggest problem. However, considering he has them all in his pocket, they must obey.) // "Ništa se ne pitaju.. Pita se samo PUTIN" (They have no say. Only PUTIN has a say.) // "On je Bog-Otac. Tačno ga treba klonirati da svaka zemlja ima po jednog Putina. I eto nam utopije." (He is God the Father. We ought to clone him so that every country could have its own Putin. Then we'd have utopia.)

These instances exhibit intriguing characteristics both in terms of vocabulary and grammar, as they depict an imbalanced relationship between the East and the West: on one side, an individual figure (Putin), and on the other, a collective plural (they must obey).

What is interesting, however, is how a previously positively connoted concept such as "size," "strength," and "power," which was used to extol and admire, is transformed into the foundation for negative sentiment:

"Putin je ratni zločinac. Užasavajuće je to kako Rusija gazi sve pred sobom; civile, žene, decu, sve." (Putin is a war criminal. It's horrifying how Russia is trampling everything in front of it: civilians, women, children, everything.) // "Kako to mislite svaka čast Putinu što zakone mijenja tako da u zatvor šalje svakoga ko progovori protiv rata i to je ok jer je ratno stanje, a istovremeno i nije ratno stanje jer Rusija ne vodi rat nego specijalnu operaciju?" (What do you mean congrats to Putin for changing the law so that he can put in jail anyone who speaks out against the war, and how that's ok because it's wartime, and at the same time you're saying it isn't war at all Russia is in, but a special military operation?).

The negative sentiment directed toward the criticism of Putin and his politics, expressed as mockery, is evident in the following example, which also includes an analogy with the Serbian geopolitical situation: "Jao stvarno nisam znao da je on ovde BOG I BATINA. Na nebu bog na zemlji Putin. Sve je Rusija samo Kosovo je Srbija" (Oh, I really had no clue that he's the be-all and end-all here. God in heaven, Putin on earth. Russia is all, only Kosovo is Serbia) // "Putin nam ispira mozak za

naše pare. Vučić se samo privalio.” “Putin is brainwashing us at our expense. Vučić is just tagging along.” // “Dao im je Happy, i tamo svaki dan “analiticari” vidjeniji rusofili i drugovi iz DB pričaju kako Putin grabi ka tituli gospodara sveta. Ustvari prvo pravi SSSR, a onda osvaja svet! Sve deluje prilično infantilno a namenjeno je putinofilima. Kao da prave neku bajku za laku noć.” (He gave them Happy [TV station], where every day, ‘analysts’, prominent Russophiles and comrades from the DB [Intelligence agency] talk about how Putin is on his way to become the master of the world. Actually, he’ll bring back the USSR first, and then he’ll conquer the world! It all seems quite infantile and is aimed at Putinophiles. It’s a production of bedtime fairy tales.) // “Svi vi koji kličete Putinu, kličete zapravo i Vučiću. Vi ste njegovi a on je vaš. Podržavate autokratiju, uzurpaciju medija, klepotkratiju, tajkune, proganjanje političkih neistomišljenika, platu od 300 usd, otimanje državne imovine. Sve to radi Putin i sve to radi Vučić.” (All of you who cheer for Putin are effectively cheering for Vučić also. You belong to him and he belongs to you. You support autocracy, media usurpation, kleptocracy, tycoons, persecution of political dissidents, \$300/month salary and confiscation of state property. Putin does all that and Vučić does the same.)

Negative attitudes toward the Russian president often center around comparisons with Hitler: “Prevedeno na razumljiv jezik - Putin postaje Firer. // Putler i bukvalno ubija Donbas.” (To put it plainly - Putin is turning into a Fuhrer. // “Putler” is literally killing Donbas.)

The portmanteau “Putler” is particularly interesting linguistically because it showcases not only the speaker’s creativity, but also the need to further discredit the Russian president in ever novel way, considering how strong the historical concepts activated in this way are.

Additionally, there are instances where negative sentiment takes on the form of some explicit warning (expressed through shouting, capital letters, etc.), thus increasing the drama:

“Uvek imati na umu! NIKAD NE VERUJTE RUSIJI. LAZU DOK U OCI GLEDAJU i kad ugovore potpisuju! Ruske rakete gađale su danas crnomorsku luku Odesu, dan posle “istorijskog” sporazuma o deblokadi izvoza žitarica. Takvo ponizenje celnika UN, Turske i svetske javnosti niko nije napravio.” (Always remember! NEVER TRUST RUSSIA. THEY LIE TO YOUR FACE, even while signing agreements! Russian missiles targeted the Black Sea port of Odessa today, a day after the “historic” agreement on lifting the grain export blockade. No leader of the UN, Turkey, or the global public has ever suffered such humiliation.

Conclusion

Considering the complexity of the relationship between language and opinions, reliable results and conclusions can be obtained only through a multi-faceted linguistic approach that encompasses all levels of linguistic and stylistic analysis. Considering that sentiment analyses of the Serbian language material and

crisis discourse on social media remain extremely scarce, and given that the goals of our work align with critical discourse analysis, we deemed it appropriate for this research to compare the results with the attitudes of Serbian language speakers as demonstrated in the associative fields of stimuli in the Associative Dictionary of the Serbian Language.

In this study, the combination of qualitative sentiment analysis (positive, negative, and neutral) and quantitative analysis (percentage distribution of all three sentiments) has shown that the attitudes of Serbian language speakers toward Russia and Russians have changed compared to previous periods (taking prior research and the mentioned Associative Dictionary of the Serbian Language as points of comparison, all of which indicate positive associations and stereotypes toward the Russian people). During the Ukrainian crisis, a negative attitude emerges, based on the current socio-political situation and other factors (historical, for instance) It is also evident that the positive sentiment rests on tradition and ingrained stereotypes, collective expressions rooted in fraternal and friendly relations, and the concept of religious closeness.

Certain problems arise when sentiment analysis is applied to tweets, which stem from the peculiarities of this format: a tweet is a very short form, often contains emoticons, frequently provoked by another tweet (a reaction to a previous comment), etc. At the same time, the methods employed in this study and the results obtained can serve for further investigations and identification of positive, negative, and neutral attitudes in crisis discourse on social media and digital media in general. It is clear that the first and last phases can be automated, but the second, third, and fourth phases of sentiment analysis, at least for the Serbian language, still require manual intervention, especially due to stylistic devices like irony and sarcasm, and the intricacies of portmanteau words that cannot be predicted (“Putler,” for example), and so on.

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Ukrajinska kriza na Tviteru: analiza sentimenta – moguće interpretacije

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Apstrakt

Masovna upotreba društvenih mreža omogućila je korisnicima da u kratkom vremenskom roku izraze i rašire mišljenja, stavove i emocije u pogledu raznih tema, a naročito društveno aktuelnih. U ovom radu analiziramo stavove govornika srpskog jezika prema Rusiji i Rusima tokom rata u Ukrajini, na materijalu pribavljenom pomoću aplikacije za prikupljanje i obradu komentara na Tviteru. Posmatran je period od februara do septembra 2022. godine. Polazeći od pretpostavke da su korisnici Tvitera, slobodniji i spontaniji u pogledu izražavanja stavova, pomoću aplikacije Bigboxdata prikupljeno je oko 11.000 tvitova na osnovu ključnih reči (Rusija, Ukrajina, rat, specijalna operacija, Putin, Zelenski...), a zatim smo ih ručno filtrirali i anotirali. Pri primeni analize sentimenta na tvitove javljaju se problemi čija specifičnost potiče iz osobnosti samog tvita: u pitanju je kratka forma, neretko kombinovana sa tzv. emotikonima, često provocirana drugim tvitom (reakcija na prethodni komentar) itd. Cilj je bio otkriti da li su se i kako menjali stavovi govornika srpskog jezika prema

Rusiji i Rusima pod aktuelnim društvenim okolnostima. Kombinacija kvalitativne (analize sentimenta: pozitivnog, negativnog i neutralnog) i kvantitavne (procentualni udeo sva tri sentimenta) analize pokazala je da su se stavovi govornika srpskog jezika prema Rusiji i Rusima drastično promenili u odnosu na prethodni period (a uzimajući kao referentni izvor Asocijativni rečnik srpskoga jezika i Obratni asocijativni rečnik srpskog jezika, koji svedoče o izrazito pozitivnim asocijacijama). Istovremeno, metode korišćene u ovom radu i rezultati istraživanja mogu poslužiti za dalja ispitivanja i identifikovanja stavova u kriznom diskursu na društvenim mrežama i digitalnim medijima uopšte.

Ključne reči: krizni diskurs, društvene mreže, stereotip

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