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## THE IMPACT OF NONVERIDICAL MARKERS ON EVALUATION IN NEWSPAPER TITLES ON WAR IN UKRAINE

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*This article studies nonveridical markers in newspaper titles on the hybrid war in Ukraine and how their evaluation is affected by it. The article provides an analysis of how significantly nonveridicality or irrealis impact the evaluation in language. The purpose of the article is to examine the linguistic elements of nonveridicality or irrealis and determine polarity sensitivity to nonveridical contexts in newspaper discourse. The methods of the research are (a) the descriptive method was used to determine the scope of nonveridicality and irrealis; (b) component analysis method allowed to identify the nonveridical markers in newspaper discourse; (c) the sentiment analysis was used to determine the polarity of the nonveridical components in the newspaper titles about the hybrid war in Ukraine; (d) the comparative method enabled to analyze the sentiment of the statements with nonveridical elements and without them; (e) the psycholinguistic method was used to explain the influence of the nonveridicality on the readers' opinion. Results. 200 titles published in 2021 about hybrid war in Ukraine in the English language media that contain nonveridical markers were analysed. These markers were studied according to their group, e.g. negation, modal verbs, verbs of intention etc. Each group had different results on the sentiment change with the introduction of the nonveridical element in the sentence. This has proven to influence the reader's view of the information provided in the media about hybrid war in Ukraine. Conclusions. It has been determined that the irrealis and nonveridicality are two terms referred to expressions, such as modals and negation, that affect the truth conditions of elements in their scope, particularly evaluative elements. They usually only slightly change the sentiment of the message. Nonetheless, it has also been found that some nonveridical markers, such as conditional sentences, negations and interrogative sentences greatly impact the evaluation, particularly shifting it to a different one. Further investigation on the nonveridicality, irrealis and its impact on evaluation needs to be done to dispose more effective and the less effective means of sentiment score change.*

**Key words:** *nonveridicality, sentiment analysis, evaluation, hybrid war, psycholinguistics.*

**Introduction.** Newspaper language is usually associated with the standards of objectivity, unbiasedness and justice. However, the journalists shape the opinion of the readers on a certain topic in their narrative of the topic. It is shown in their choice of words, which consciously or subconsciously includes their evaluation of the narrated events.

The effect of nonveridical markers on sentiment analysis has not been studied in depth before. The nonveridical units were studied according to their group, e.g. negation, modal verbs etc. and they were not studied comprehensively with the comparison of different groups, which we undertook in this research.

There are three main branches of the studies of how negation can influence the evaluation: the effect of negation on opinion expressions, the types of negation means employed and the methods used to change the polarity of opinion expressions.

Evaluation is perceived as an umbrella term that can be demonstrated as appraisal, the expression of stance or subjectivity. These terms are referred to expressions, such as modals and negation, that affect the truth conditions of elements in their scope, particularly evaluative elements. Any parts

of speech that convey sentiment can be intensified or downtoned. The accuracy of evaluation in sentiment analysis may be impeded. Such language categories as irrealis and nonveridicality influence the sentiment score, and therefore, may change the reader's perception of the media message. Thus, the **relevance** of the research lies in the study of the strength of the nonveridical markers' impact on the evaluation of the newspaper titles concerning hybrid war in Ukraine.

The evaluation may be definitive, or it may be tempered by nonveridical elements. As is stated by Taboada (2016) "evaluation and nonveridicality engage in an obvious interaction." Therefore, the sentiment analysis score may be influenced by veridicality. Consider the difference in sentiment in the following two sentences:

(1)	She is a good employee.
(2)	She could be a good employee.

The **goal** of this study is to identify the markers of nonveridicality and irrealis and research how strongly each group influences the evaluation of the newspaper titles.

The **objectives** of the research are to explore the concepts of irrealis and nonveridicality; classify the types of nonveridical markers; identify newspaper titles from 2020–2021 about hybrid war in Ukraine with the nonveridical markers; research how the sentiment score of these titles changes with the absence of the nonveridical marker; make conclusions as to what are the most and the least effective nonveridical markers and how they influence the psycholinguistic perception of the media message by the readers.

**Methodology.** At the first stage of the research, the descriptive method was used to determine the meaning of the concepts of nonveridicality and irrealis. It was also researched how these concepts are linguistically expressed. In the second stage, the newspaper titles on hybrid war were researched and component analysis was used to identify the ones with nonveridical markers. Then sentiment analysis method was employed to determine the sentiment score of the newspaper titles with nonveridical components. The comparative method allowed us to identify the sentiment score and polarity change in the statements with the extractions of nonveridical markers. Finally, the psycholinguistic method helped to analyse the impact of the nonveridical expressions on the recipients' mindset.

Overall, 200 titles published in 2021 about hybrid war in Ukraine in the English language media that contain nonveridical markers were analysed.

In this research, we made the following hypotheses:

- Negative sentiment statements with nonveridical factors become neutralised.
- Statements with positive evaluation with the introduction of nonveridical elements also become neutralised.

**Results and Discussion.** The linguistic units that change the sentiment score of the utterance were not widely researched before. Among the scholars who have undermined such research within recent time, we would like to mark Taboada (2016), her collaborative research with Trnavac (2012) and Benamara et al. (2016). They have identified that the concepts of nonveridicality and irrealis impact the evaluation.

Irrealis refers to expressions that indicate that the events mentioned in the utterance are not factual (Taboada, 2016). Nonveridicality is a wider concept, including all contexts that are not veridical, that is, not based on truth or existence (Trnavac and Taboada, 2012). The linguists indicate such nonveridical elements as negation, modal verbs, intensional verbs, imperatives, questions, protasis of conditionals, habituals and subjunctive mood (in languages that have an expression of subjunctive).

Nonveridicality is used to express the modalities of possibility, necessity, permission, obligation, or desire, and it is grammatically expressed via such language units as adverbial phrases (*slightly, probably, definitely*), verbs in conditional mood, modal verbs (*may, might, should*), and intensional verbs (*think, believe, want, suggest*). Adjectives and nouns can also be used in modal form (*a probable cause; It remains a possibility*) (Benamara et al., 2016).

According to Taboada and Trnavac (2012), nonveridicality is a wide concept that includes the contexts that are not veridical, i.e. not based on truth or existence. It is used to express possibility, necessity, permission, obligation, or desire. Nonveridical markers include such language units:

- **Negation** – opposite polarity (“Rising Tensions in Ukraine Are Not Necessarily a Prelude to Renewed ‘Hot’ War” Rusi, 29.03)

- **Modal verbs** – slight change in polarity (“Ahead of Biden-Putin summit, Ukraine leader tells Americans war with Russia could “be tomorrow in their houses” CBS News, 15.06)

- **Intentional verbs** – slight change in polarity (“US aims to mediate Russia-Ukraine conflict” DW, 05.05)

- **Adverbs** – change the sentiment score by 30 points maximum (“Why Russia and Ukraine are Likely Headed for an Escalation in Their War” The National Interest, 20.07.)

**Conditionals:**

- **0 conditional** – slight change (“The U.S. and NATO promised to protect Ukraine. If Ukraine is the aggressor, all bets are off” The Washington Post, 14.03).

- **1st&2nd conditional** – opposite polarity (Ukraine finally had a strong leader who would bite back if attacked” Atlantic Council, 04.03).

- **Questions** – positive to neutral (“Rumors of War: Another Russian Surprise in Ukraine?” RKK ICDS, 30.03)

- **Subjunctive mood** – does not greatly impact the evaluation, however may change the polarity (“Kremlin warns that Ukraine joining NATO would exacerbate Donbas conflict” Meduza, 07.04)

The concept of nonveridicality should also not be confused with evidentiality. According to Benamara et al. (2016), evidentiality may be expressed by means of nonveridical meanings and have different shades within veridical propositions. Therefore, something can be presented as veridical, but at the same time the speaker may distance oneself from it using evidential markers (e.g., It is said to be a dead-end situation).

Nonveridicality may impede the accuracy of sentiment analysis by expressing the opposite polarity of the evaluative expression (in negation),

downtoning hedging (in modal verbs or intensional verbs), using complex means.

Further, we investigated how different kinds of nonveridical markers influence the sentiment score of the newspaper titles of hybrid war in Ukraine.

### Negation

The part of negation in sentiment analysis shows an interesting asymmetry. It is supposed that negation will change the polarity of the sentiment to the opposite one. However, it is not always the case. In any case, it is important to identify what is considered as negation. In this analysis, we take into account only the negation of the evaluative statement without analyzing the other parts of the sentence that may be affected by negation.

There are syntactic and morphological means of expressing negation. Negation is not only expressed by such words as *no*, *not*, but *none*, *never*, *nobody*, *nothing* should also be taken into consideration. Other words with negative sentiment are *without*, *almost*, *lack*. Blanco and Moldovan (2013) have described the scope of negation and how it can be expressed in their computational research.

In terms of sentiment score change, negation can turn it to the exactly opposite polarity. This process is called switch negation and it can happen in case of *good* and *not good*, for example. However, it's important to consider the subtleties of negation to identify its influence on the sentiment score change correctly. It is usually downtoning in sentiment score that the negative markers cause. For example, the adjective *great* has a +5 sentiment score, *not great* will unlikely go down to -5.

A strongly positive word seems to be unlikely to obtain an opposite sentiment with the addition of a negation marker. An opposite sentiment to *great* will be more likely shown in such words as *awful*, *horrible*. Therefore, such nonveridical markers, as negation means would usually downtone the sentiment score of the positive word by a few points, which is called shift negation.

In the research, we found that the absence of the negation markers may make the expression positive, although not to the same degree as in negative polarity. For example, the title "Rising Tensions in Ukraine Are Not Necessarily a Prelude to Renewed 'Hot' War," (Rusi, 29.03.) has an overall sentiment score -0.45, but without the negation marker the title shows +0.71 score. The sentiment shift that is more common with the absence of the negation marker is neutralisation. For instance, this title has a negative sentiment (-0.59) "Why Russia may not be planning the invasion that Ukraine fears" (BBC News, 15.04.). However, without the nonveridical markers of negation, it is neutral (+0.17).

### Modal Verbs

There are three types of modality in the English language: epistemic, deontic and dynamic or buletic. Epistemic modality is used to express the speaker's belief in the propositional statement that they assert (e.g., *This reform may improve the country's economy*). In this type of modality such modal verbs are used: *may*, *might*, *must*, *can*, *could* and *will*. Epistemic modality gives the statement an assumptive, potential, speculative or subjunctive meaning.

Deontic modality describes an obligation or a possibility (e.g., *They should continue working on the agreement*). The following modal verbs are used to express this type of modality: *may*, *can*, *must* and *should*.

Dynamic or buletic modality is used to indicate the speaker's ability or willingness to do some action (e.g., *The politician will try to regain trust*). Respectively, such modal verbs as *can* and *will*, are used to describe this type of modality.

Modal verbs are often used to describe the sentiment of the author to the statement. The type of modality may not always be easily identified, as one auxiliary modal verb may be used to express different types of modality. For example, *can* is used to express epistemic, deontic and dynamic modalities. Therefore, to identify the type of modality the meaning of the sentence should be interpreted.

Modal verbs do not influence sentiment polarity greatly. The title "Ahead of Biden-Putin summit, Ukraine leader tells Americans war with Russia could be tomorrow in their houses," (CBS News, 15.06.) has a +0.64 sentiment score, without the modal verb this score changes to (+0.56). Similar results were received upon checking other modal verbs, such as *can*, *may*, *might*, *should*. The only difference appeared with the modal auxiliary verb *must* in the title "Ukraine must prepare for Putin's next escalation now" (Atlantic Council, 13.07.). In its original form the title had a negative sentiment showing -0.52 score, although without the modality it is neutral (-0.12).

### Verbs of Intention

Verbs have great value in defining the polarity of the text. Verbs of intention have their impact on the change of the sentiment score of the message.

Intensional verbs are divided into such categories: non-specificity, failure of extensional substitution and lack of existential import. Intentional verbs of no specificity express actions that are not factual with the property under discussion that does not amount to the existence of proof (e.g., *The citizens peacefully embraced the city change*).

In the intentional verbs with failure of extensional substitution there is an independent reading

of two sentence parts. For example, in the sentence: “He was searching for the best chairman of the party” the nominal predicates have the same extension in utterance.

Lack of existential import is close to the previous category of intentional verbs. However, the utterance may be regarded as true if some conditions were changed. For example, the sentence “The economy is riding a wave of inflation” is based on the notion that it is possible that something happens even though it does not exist.

Intentional verbs are usually expressed by:

- verbs of search usually followed by a preposition *for* (*look for, hunt for, quest for*)
- verbs relating to desires (*want, wish, long for, hope, desire*)
- “psychological verbs of absence” indicated in Torza (2015) article (*need, lack, demand, omit, require*)
- verbs of comparison (*compare, differ, resemble, imitate*)
- verbs of depiction and creation (*imagine, plan, envisage, assemble, make*)
- verbs of anticipation (*expect, foresee, await*)
- cognitive verbs (*see, recognize, feel*)
- verbs of veneration and worship (*respect, admire, adore, honor*)

It was shown in previous studies of intentional verbs that they downtone the sentiment of the statement by using non-factual information. Our research has proven the same results, e.g., the title “Ukraine attempts to try ex-Donbas militant leader” (Kyiv Post, 02.08.) has a negative polarity (-0.61). However, without the intensional verb *attempt* the polarity shifts to neutral (+0.19).

### Adverbs

Adjectives and adverbs depending on their valence change the sentiment score by intensifying it or downtoning it. They should be taken into account when conducting sentiment analysis for accurate identification of the sentiment score. It is also important to note that they have different levels of intensification or downtoning. *Extremely* and *rather*, for example, have a different sentiment value. Additionally, the value of the intensified or downtoned word is also of high importance in defining the sentiment score. A noun or a verb that has a high sentiment score with an intensifier will become even higher and vice versa. The same works for downtoning.

Adjectives and adverbs can be classified into two groups: the ones that intensify and downtone the sentiment score of the noun and the whole statement. Taboada et al. (2016) upon their findings propose such values to some of the adverbs: *most* +100%, *really* +25%, *very* +15%, *somewhat* -30%, *arguably* -20%.

In our findings, adverbs change the score by +30 points at most, considering such adverbs as *strangely, highly, quickly, clearly, predominantly* etc. We’ve also studied the impact of the adverb *deeply* on the sentiment score of several newspaper titles of hybrid war in Ukraine. It generally acts as an intensifier of the sentime score (+15%).

### Conditional Sentences

The sentences that describe implications or hypothetical situations and their consequences are called conditional (Narayanan et al., 2009). Conditional sentences are composed of two clauses that are dependent on each other: the conditional and the consequent clause. Usually a conditional sentence starts with the preposition *if*. However, there are many other words and expressions that can be used to express conditions, such as *unless, even if, until, as (so) long as, assuming, supposing, in case, only if*.

There are four types of conditional sentences in the English language.

- Zero conditional form is used to express universal statements, such as facts or rules. In this type of conditional both the condition and consequent clauses are in the Present Simple tense, e.g., *If they take a bribe, they are corrupted*.

- First conditional form is used to express a hypothetical situation and it’s probable result. In this form the condition is described in the Present Simple tense, but the consequent can be in the past or present tense with a modal auxiliary verb preceding the main verb. For example, *Unless they do something with the reforms, the economy will collapse*.

- Second conditional form describes a less probable situation, the speaker’s preference or an imaginary event. The condition clause in this form is in the Past tense and the consequent clause includes a conditional verb modifier, such as *would, should, might* before the main verb, e.g., *If the statesman kept his word, the population would not turn their back on him*.

- Third conditional form is used to express impossible events in the past. The condition clause is in the form of the Past Perfect tense and the consequent clause is expressed by the Present Perfect tense, e.g., *If she hadn’t fooled the crowd, they would have believed her*.

Narayanan et al. (2009) conducted sentiment analysis of conditional sentences. They developed supervised learning models that help to determine if sentiments in a conditional sentence are positive, negative or neutral. Liu (2012) studied common patterns in conditional sentences on the basis of reviews, online discussions, and blogs about products that often indicate sentiment. We attempted to determine whether conditional sentences in

the newspaper titles on the hybrid war in Ukraine express a positive, negative or neutral sentiment.

The use of conditionals as a part of nonveridicality and their impact on the coherent relations in evaluation has been roughly studied by Trnavac and Taboada (2016). However, we researched how different types of conditionals impact the evaluation of the newspaper titles.

We found that the conditional sentences show different significance of the polarity influence based on the type of the conditional. Zero conditionals, as they are used for expressing real situations and facts, can be predicted to not have a great impact on polarity change. This prediction was justified in our research. The following title is shown to have a negative sentiment (-0.53): "The U.S. and NATO promised to protect Ukraine. If Ukraine is the aggressor, all bets are off." (The Washington Post, 14.05.). Without the conditional part the same sentence shows a more negative sentiment (-0.6), although the overall polarity change is insignificant. However, when other types of conditionals are involved in the sentence, the polarity change is more salient. For example, the title "Ukraine finally had a strong leader who would bite back if attacked" (Atlantic Council, 04.03.) has a negative sentiment score (-0.61). Without the condition, the sentence has a neutral polarity (+0.17).

#### **Interrogative Sentences**

Interrogative sentences are the ones that ask a question as opposed to the sentences that provide a statement, command or express an exclamation. An interrogative sentence is punctuated with a question mark at the end. Such sentences are usually marked by an inversion of the subject and the predicate.

Interrogations usually have a noticeable influence on the sentiment score. For example, the sentence "Why does Putin want a Ukrainian crisis?" (EU Observer, 06.04.) has a negative polarity (-0.57). However, if this sentence is turned from an interrogative into a declarative one, its polarity becomes neutral (0.15).

#### **Subjunctive Mood**

Subjunctive mood is often found in subordinate clauses that express a possibility or an action that has not yet occurred. The action is described in the form of a wish, a possibility or a necessity. Subjunctive mood is used to express opinion implicitly. Previous research on the role of subjunctive mood in sentiment change include the work of Goldberg et al. (2009) who studied wish detection on datasets obtained from political forums and product reviews. Ramanand et al. (2010) distinguished the category of wish and suggestion and formulated syntactic patterns for suggestion detection.

We found that the presence of the subjunctive mood in the sentence does not significantly influence the overall sentiment score of the statement. For example, the title "Russia-Ukraine border crisis: Merkel demands Putin reduce Russian troops around Ukraine" (Wionews, 08.04.) has a neutral sentiment (-0.1). Without the subjunctive construction, the sentiment rises to +0.13, however remains neutral.

In terms of psycholinguistic mapping, we can see that the nonveridical markers, although usually not significantly, still can change the polarity of the statement. This is reflected in the perception of the media message by the readers. Nonveridicality presents a wide space for subjective reasoning, as the message itself is presented as hypothetical, as opposed to the real conditions. Therefore, the readers' perception of the message can be manipulated in the necessary way. Moreover, this manipulation is not salient but rather soft, which makes it a powerful tool in the hybrid war. Such psycholinguistic influence of the nonveridical means can only be noticed upon contemplation and investigation.

**Conclusion.** The newspaper reports are not entirely stripped from evaluation. The choice of words in which the message is expressed is crucial in shaping the readers' opinion of the topic. Such linguistic concepts as nonveridicality and irrealis impact the evaluation of the topic discussed in the newspapers. In this research, we aimed to identify how strongly different nonveridical markers influence the polarity and sentiment score of the English language newspaper titles on hybrid war in Ukraine.

First, we researched how the means of nonveridicality and irrealis are linguistically expressed. Then, we identified 200 articles published in 2021 in the English language newspapers with nonveridical markers in their titles with the help of component analysis method. Then, using the computational linguistic method of sentiment analysis and the comparative method we analysed the strength of the influence of nonveridical markers on the polarity of the newspaper title. It has been hypothesised that the positive and negative sentences become neutral in their polarity. However, we found that usually nonveridical markers do not greatly change the sentiment score of the text.

Among the most effective nonveridical markers we found such language means, as conditional sentences, negations and interrogative sentences. These linguistic devices shift the polarity of the message to an opposite one. The other language units, such as negation, modal verbs, adjectives and adverbs, subjunctive mood and verbs of intention usually change the sentiment score to several

points, in some cases neutralising it. It has been found that nonveridical markers present effective tools of psycholinguistic influence in hybrid war because of their hardly noticeable nature.

We assume that further research on the means of nonveridicality and irrealis and their influence on evaluation needs to be done to find their role in psycholinguistic mapping in newspaper discourse.

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## **ВПЛИВ МАРКЕРІВ НЕВЕРИДИКАЛЬНОСТІ НА ОЦІНКУ В ЗАГОЛОВКАХ АНГЛОМОВНИХ ГАЗЕТ ПРО ВІЙНУ В УКРАЇНІ**

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*У цій статті були досліджені маркери неверидикальності в заголовках газет про гібридну війну в Україні їх вплив на психолінгвістичну оцінку читачів. Мета. Дослідити мовні елементи неверидикальності та ірреалістичності та визначити їх вплив на валентність повідомлення у газетному дискурсі. Методи. 1. Описовий метод був використаний для визначення понять неверидикальності та ірреалістичності; 2. Метод компонентного аналізу дозволив виявити маркери неверидикальності в газетному дискурсі; 3. Сентимент-аналіз був використаний для визначення полярності компонентів неверидикальності у заголовках газет про гібридну війну в Україні; 4. Порівняльний метод дозволив проаналізувати валентність висловлювань з неверидикальних елементами та без них; 5. Психолінгвістичний метод був використаний для пояснення впливу неверидикальності на формування думки реципієнтів газетних новин. Результати. Було проаналізовано 200 заголовків англійських газет, опублікованих у 2021 році про гібридну війну в Україні, які містять маркери неверидикальності. Ці маркери були досліджені відповідно до їх групи, серед яких заперечення, модальні дієслова, дієслова наміру тощо. Маркери кожної групи показали різні результати щодо впливу неверидикальності на валентність повідомлення. Крім того, було виявлено, що неверидикальні маркери є ефективними засобами психолінгвістичного впливу в умовах гібридної війни. Висновки. Було визначено, що поняття “irrealis” та “nonveridicality” є термінами, що позначають такі мовні вирази, як модальні дієслова та заперечення. Вони впливають на оцінку повідомлення читачами у газетному дискурсі. Проведений сентимент-аналіз показав, що зазвичай вони їх вплив на зміну валентності повідомлення не радикальний. Однак, було також виявлено, що деякі маркери неверидикальності, такі як умовні речення, заперечення та питальні речення, сильно впливають на валентність повідомлення, а саме змінюючи її на протилежну. Необхідно провести подальші дослідження щодо елементів неверидикальності та їх впливу на оцінку, щоб виокремити більш ефективні та менш ефективні засоби зміни оцінки повідомлення.*

**Ключові слова:** *неверидикальність, сентимент-аналіз, оцінка, гібридна війна, психолінгвістика.*