Ironic opinions on Polish Reddit: Description and computational methods of analysis

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Abstract

The paper analyses ironic comments as forms of expressing opinions posted by social media users, specifically on Polish Reddit. The study resorts to Gricean and neo-Gricean theories and typologies adapted to analyse the (syntactically) imperfect, spontaneous and colloquial discourse used online on social media. In this analysis, various corpus and computational tools are deployed to scrutinise types of irony, topics, and functions. The results have clearly shown that the most frequent type of irony used by Reddit authors is lexical irony, the predominant function is jocular irony, and the overall sentiment of the comments is negative. Ironic comments on the Polish Reddit (subreddit '/s') are primarily used to express opinions about institutions, events, things and generally the third party, and rarely to attack an individual. The study also shows how advanced computational tools available for the Polish language can be used in a language analysis of opinionated texts.

Ironiczne opinie na polskim Reddicie: Opis i metody analizy komputerowej

Abstrakt

Artykuł analizuje ironiczne komentarze jako formy wyrażania opinii zamieszczanych przez użytkowników mediów społecznościowych, w szczególności na polskim Reddicie. Badanie odwołuje się do teorii Grice'a i podejść neo-Grice'owskich. Istniejące typologie ironii zostały zmodyfikowane, aby możliwe było ich zastosowanie w analizie (składniowo) niedoskonałego, spontanicznego i potocznego dyskursu używanego online w mediach społecznościowych. W celu zbadania wypowiedzi ironicznych, np. rodzaju ironii, tematyki opinii ironicznych oraz funkcji ironii, wykorzystano różne narzędzia korpusowe i komputerowe. Wyniki wyraźnie wskazują, że najczęściej używanym rodzajem ironii przez autorów Reddita jest ironia leksykalna, dominującą funkcją jest ironia żartobliwa, a ogólny wydźwięk komentarzy jest negatywny. Ironiczne komentarze na polskim Reddicie (subreddit '/s') są głównie używane do wyrażania opinii o instytucjach, wydarzeniach i ogólnie o osobach trzecich, rzadko natomiast do atakowania innych użytkowników Reddita. Badanie pokazuje również, jak zaawansowane narzędzia komputerowe dostępne dla języka polskiego mogą być używane w analizie językowej tekstów opiniotwórczych.

1.   Introduction

The main aim of the paper is to identify, classify and describe ironic comments prevalent among users of social media platforms, with a specific focus on the Polish Reddit, by resorting to various computational tools, both the now classic corpus linguistics methods and the more advanced AI-based algorithms. Drawing upon various up-to-date typologies and definitions, the vague status of the linguistic concept of verbal irony is elaborated in section 2. This section also describes categories used in this study, which modify the existing typologies. The term *irony* is juxtaposed here with sarcasm, often used interchangeably with irony by social media users. In section 3, the data and the methodology are described. Moreover, the computational tools instrumental in the analysis are also mentioned in this section. The aims and research questions are elaborated in detail in section 4.1, while in section 4.2, the outcomes of qualitative and quantitative investigations are reported. Finally, conclusions are presented in section 5.

2.   Verbal irony

This section will present a concise theoretical overview of literature devoted to the definitional and typological considerations of verbal irony. Based on the succinct description of the scholarship, the following subsection will signal how the typology and definitions deployed in this study differ from the existing ones and what categories have been applied to our data from social media discourse.

2.1. Previous studies

Verbal irony (henceforth: irony) is a figure of speech whose aim is to express demeaning and derogatory comments to hurt the

addressee[1] of these comments (Grice 1989). The Gricean understanding of irony assumes that the speaker flouts one of the widely-known maxims he proposed, namely the maxim of quality ("Be truthful"). He also stated that irony was used to express malicious content, i.e., one aiming at expressing hostility, derogation or contempt (Grice 1989: 53)[2]. This classical definition has been further developed over the past decades, and a number of subtypes of irony have been offered by various scholars (inter alia by Kerbrat-Orrechioni 1986, Gibbs and O'Brien 1991, Sperber and Wilson 1986, Garmedia 2010, Kapogianni 2013). The function of irony has also been extended to encompass jocularity as a purpose of irony (Partington 2006) and insincere praising/complimenting (Kumon-Nakamura et al. 1995). The most oft-repeated facet of irony is that it encodes a meaning, which is the reversal of what is being said (Cutler 1974, Partington 2006, Kapogianni 2013). Therefore, by saying *You're so wise* the speaker actually means the opposite (*You're so stupid*), and thus irony illustrates *evaluation reversal* (Partington 2007). There is an element of surprise in irony, i.e. the receiver does not expect to hear what the speaker is saying (Giora 1995). The contradiction contained in the irony, rooted in blatant falsehood, may be word-based (lexical opposition, usually based on binary antonyms, predominantly adjectives and adverbs; Seto 1998) or sentence-based. For example, *You're so wise* assumes that the receiver will resort to the binary antonym of *wise* (i.e. *stupid*) to retrieve the meaning of what is said (traditionally referred to as *propositional irony*), while in *Thank you very much* expressed ironically the receiver is expected to contradict the

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[1] While the addressee need not be the target of an ironic comment, this distinction is invalid in the present discussion, and thus the terms will be used interchangeably. This distinction is neatly explained by Holdcroft (1983: 496), where the notion of the addressee is extended to encompass all ratified and unratified members of the audience: "Sometimes T [Target] and A [Audience] are identical. But sometimes T is only part of the audience, and, possibly, not even intended to notice the irony, though the rest of the audience is".

[2] Kumon-Nakamura et al. (1995: 4), however, notice that while in Grice's theory hostility is the necessary condition for irony, in more recent account "negativity may not be an intrinsic property of the ironic form."

whole utterance/sentence to interpret the speaker's intention appropriately. In the latter example, the illocutionary force of the entire utterance is reversed based on pragmatic negation (also known as *pragmatic irony*).

This widely known and used definition of irony charted above, relying on the Aristotelian tradition of meaning opposition (irony seen as a negation) and flouting Grice's maxim of quality, does not do justice to the array of irony types identified by a number of other scholars; particularly "irony with no flouting" (Garmendia 2018: 35). For example, while the *wise/stupid* example illustrates a requirement of finding its contradiction, word-based opposition may also be realised by resorting to partial opposition, as in *You're a bit tipsy* said to somebody completely drunk. Here, the reversal of meaning is present only to some degree; thus, the irony is scalar (Kapogianni 2014). Ironic comments may also employ absurd references, as in the case of surrealistic (i.e. absurd) irony (Kapogianni 2014), e.g. *And I'm Marilyn Monroe* replied to a comment *I'm so beautiful*. The reversal of meaning can rely on highlighting background information and de-emphasising the figures in a scene, as in - *Am I dizzy? - No, it's the world that goes round*, which Kapogianni (2014) dubs *replacement* (as opposed to the reversal, which is more typical of irony). One of the least-known types of irony is dubbed verisimilar irony (Gibbs and O'Brien 1991: 525). It occurs when the speaker states a truthful assertion (and thus does not flout the Gricean maxim of Quality), yet it stresses a clash between what is being said and the background knowledge. Therefore, the well-entrenched understanding of irony built on meaning contradiction is not in operation here. The speaker communicates something he believes to be true (i.e., makes it *as if to say*) while, in fact, expecting the receiver to infer the speaker's meaning by its (conceptual) negation, which is triggered by the incompatibility of the truthful evaluation with the contextual clues and circumstances in reality. Put differently, the meaning stemming from what is said (Grice 1989) is truthful, yet this is not necessarily tantamount to what

the speaker wishes to communicate, which is some evaluative opinion captured by the reconstructed implicature. Thus, this type of irony hinges on the clash rather than a contradiction, as no evaluation reversal is invited. Another type of irony, dubbed SAT-based here, is motivated by the Searlian Speech Act Theory (Searle 1975). In line with this reasoning, a proposition can be ironic without anchoring its content in meaning reversal, but instead in the inconsistency between the sentence structure used and its function. The classic example is cited from Searle: *Can you pass me the salt?* (see Figure 2a for an ironic example). The proposition has the structure of an interrogative while, in actual fact, it is a request. There are more types of irony credited to various authors, e.g. dramatic irony, situational irony, Socratic irony, and several theoretical frameworks irony is motivated by, such as the echo-based irony proposed within the Relevance Theory or the pretence Theory (Sperber and Wilson 1986) where irony is couched in the assumption that the speaker pretends to be somebody else (echo-based and pretence related theory are tightly connected).

The figure of irony is often discussed in the context of a similar concept, viz., sarcasm. Whilst there are some voices that these are two separate concepts (Fowler 1965, Garmedia 2010, Lombart 2022), others claim that sarcasm is a subtype of irony (e.g. Gibbs 2000, Alba-Juez and Attardo 2014, Bączkowska 2023), a view supported here. Sarcasm is a stronger form of irony, requiring a target the speaker wants to hurt. Drawing the line between ironic content and its stronger form (sarcasm) is tricky; hence, the two terms will be treated on par in the following study. In favour of this approach come also observations by Attardo (2013), who maintains that in American English, irony is associated only with situational irony, and verbal irony is labelled as sarcasm by social media users. This trend has also been observed on Polish social media. Hence, the data at hand were tagged as sarcastic by the authors[3] of comments, even

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[3] Technically speaking, the authors of a comment need not be the posters

though, linguistically, not many of them actually express sarcasm; the vast majority refer to various forms of verbal irony. This study limits its scope to contexts labelled as sarcastic/ironic by the comments' authors on Reddit, who often explicitly guided the readers to interpret the comments as ironic/sarcastic by resorting to metalanguage (marking the comments with "/s").

2.2. The typology of verbal irony used in this study

Generally speaking, the typology of irony used in this study draws on categories previously elaborated by some of the aforementioned authors, who based their proposals on Grice's theory and further elaborated the Gricean theory (mainly as part of the neo-Gricean approach and with the exclusion of post-Gricean theory), in particular Gibbs and O'Brien (1991), Kumon-Nakamura et al. (1995) Partington (2006), Garmedia (2010) and Kapogianni (2013). Our study benefits considerably from Kapogianni's (2014) considerations, which we find particularly relevant for our empirical investigation, even though we depart from her original typology in a number of ways for reasons elaborated below. The study presented here, however, also has the objective of contributing to the development of the theory of irony yet on the level of its practical implementation. On the one hand, it pools together a number of cases discussed by various authors as separate concepts or as a part of their typologies, which, however, encompassed a smaller number of irony subtypes than employed here. Thus, our theoretical framework offers a more comprehensive overview by marshalling existing irony types. For example, Kapogianni (2014) proposes her typology of verbal irony, which consists of two superordinate categories (*meaning reversal* and *meaning replacement*), which are divided into two main groups: the former splits into *absolute* and *relative*

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of the comment, that is those who put the message on social media platform, yet these two terms will be treated here interchangeably as the distinction is irrelevant for the present discussion.

(*scalar*), and the latter bifurcates into *context relevant* and *context irrelevant*. These options add up to four cases, whereas our schema contains seven categories.

The other contribution of this study to the theoretical investigations of verbal irony is the fact that it simplifies some of the terms presented by previous authors. The simplification is two-fold. Firstly, the very names of the categories are simplified. For example, lexical irony replaces Kapogianni's (2014) *absolute meaning reversal*, as the mechanism behind this term is thus easily envisaged. Similarly, *context relevant meaning replacement* (Kapogianni 2014) is substituted by figure/ground irony, a construal borrowed from cognitive linguistics (Langacker 1987). Secondly, the simplification of the understanding of categories is to make them less prone to overlapping definitions (if not to offer fully discrete categories). The distinction between lexical and sentence-based irony (versus propositional and pragmatic irony) is a case in point. The problem regarding the distinction between propositional and pragmatic irony is described below by two examples, *You are fired* and *How old are you?* which display the possible ambiguities and, thus, difficulties annotators face. The objective of simplification stems from the need to make the schema more manageable for empirical studies reliant on mapping the typology of irony onto real data derived from social media. The definitions and examples offered by scholarship on verbal irony so far rely primarily on contexts invented by the scholars themselves (following the armchair method) to provide explanations and exemplification of specific types of irony they propounded; alternatively, they are based on fictional (film) discourse (e.g., in Kapogianni 2014), which is also a smoothed version of naturally occurring discourse (Alvarez-Pereyre 2011; Bączkowska 2022a). Implementing the categories illustrated by carefully contrived instances written in appropriate English in terms of syntax and lexis for the sake of illustration of a novel category is far from easy when real data from Internet communication are at hand, which are often written in colloquial language, with imperfect syntax or lack of cohesion

and which tend to depart from grammatical correctness. This is partially imposed by technological determinism (Herring 2013) and partially flows from the nature of computer-mediated online communication (Herring 1996). Kapogianni (2014: 597) admits with regard to opposition-based and scalar irony, i.e., one involving meaning reversal, that irony tends to be "at risk of misinterpretation in natural discourse", a view with which we fully agree; moreover, this claim seems to refer to all types of irony encountered in natural social media discourse, not only to one based on antinomy.

The schema applied to the data from Reddit dissected in this paper engulfs seven categories described below, i.e., a wide array of cases. Yet, they are defined to maximise discreteness across categories and thus facilitate coding.

The first category – **lexical irony** – is one built on word-based antonymy. In Kapogianni's (2014) typology, it would be inserted under the rubric of *absolute meaning reversal irony*. This type of irony, however, can hardly be seen in terms of absolute categories inasmuch as a word replaced by its antonym necessarily has a bearing on the reading of the entire sentence, and it affects its interpretation at the what is implicated level. The word is not in a vacuum but contextualised; hence, the absolute status of the antonym is not endorsed here.

The second category is termed **sentential irony** here, and it partially overlaps with what is dubbed *pragmatic irony* and is usually contrasted with *propositional irony* in previous studies (e.g., in Kumon-Nakamura et al. 1995). Propositional sentences rest on declarative sentences, which express the state of affairs (Hurford and Heasly 1983: 19); in other words, they rely on assertions. Non-declarative sentences cannot be counted as *propositional irony* as they do not contain assertions (i.e., they are non-assertoric, to use Frege's (1960[1892]) parlance). They belong in what is sometimes dubbed *pragmatic irony* (Kumon-Nakamura et al. 1995). Hence, the Searlian expressives, comissives, declarations and directives constitute a separate group from assertives in irony typologies. The former are often called

pragmatic irony and the latter *propositional irony*. Not all schol-
ars follow this division. For example, Kumon-Nakamura et al.
(1995: 19) do allow some assertives to belong in the concept of
pragmatic irony: "a pragmatically insincere utterance from any
of the five major speech act categories may, if it is used to allude
to a failed expectation or norm, convey irony". In our schema,
sentence-based irony assumes that the whole sentence under-
goes a reversal of meaning as the speaker's pragmatic intention
is reversed, which usually entails non-assertoric sentences, as
they rely on insincere speech acts. Yet we also allow assertions
to be included in this group as, in fact, they can also flow from
insincerity and lead to failed expectations or norms, and thus,
in this respect, we follow Kumon-Nakamura et al.'s proposal.
Such cases seem less frequent but possible, and they are often
subsumed in our study by figure/ground irony, surrealistic or
verisimilar irony. The broad category of sentence-based irony in
our schema thus encompasses both assertives and non-asser-
toric sentences.

    The distinction between assertive speech acts and some of
the other types of Searle's speech acts can occasionally be chal-
lenging to grasp,[4] especially for annotators, whose task is ap-
plicative and practical rather than theory-oriented and who
need to deal with imperfect online discourse. For this reason,
assigning all speech acts to one group (sentence-based irony)
appears more intuitive and manageable. Contrary to our ap-
proach, for Holdcroft (1983), *propositional irony* incorporates
lexical reversal (along with sentence/utterance-based), which
here is spanned by lexical irony. As a result, in Holdcroft (1983),
propositional irony consists of lexical reversal and incompatibil-
ities encoded by sentences/utterances, but only those which

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    [4] One source of confusion can be sought in the fact that except for im-
perative-based expressives, all other speech acts are statements resting on
indicative mood (mostly affirmatives); as a result, it may be difficult to distin-
guish between them, e.g., *You are fired* may be a declaration or an assertive.
Verifying this doubt in written discourse, especially in the context of ironic
communication, which may be conflated with humour, may prove a daunting
task.

contain assertives. Those which are non-assertive, i.e., sentences leaning on other speech acts, are classified as *pragmatic irony*. This division may cause confusion coding-wise, so it is replaced in the schema applied to our data by lexical irony involving word-based reversal and sentence-based irony spanning all the other speech act-related cases, i.e., declarative and non-declarative irony. This makes the category of sentence-based irony more coarse-grained but, at the same time, easier to apply to the imperfect discourse of social media.

Interestingly, Kumon-Nakamura et al. (1995: 8) discuss a case wherein the speaker expresses a sincere request, i.e., a desire to make the addressee do something, which, however, is overpolite, which ultimately makes it insincere inasmuch as it shows disrespect towards the interlocutor, and thus it is no longer a polite request but rather a covertly impolite reproach. The request stated in this way is ironic, yet it does not premise on meaning reversal/opposition; instead, it shows some gradable (scalar) meaning. The authors claim that such cases are aligned with the speaker's communicative intentions and, thus, they rightly count them as examples of *pragmatic irony*. In line with the schema employed here, *pragmatic irony* understood in this way would be classified as sentence-based irony (yet such cases did not occur in our dataset).

Thirdly, there is **surrealistic irony** in our schema, termed so after Kapogianni (2014). Although she also dubs it a *context irrelevant meaning replacement* (Kapogianni 2014), we do not see surrealistic (i.e., absurd) irony as entirely context-free. In Kapogianni (2014), this category is spanned by the superordinate term of *meaning replacement*. The fourth category is **scalar irony**, or *relative meaning reversal*, in Kapogianni's (2014) parlance. The fifth category in our schema is **Figure/Ground-based irony**, called *context-relevant* irony in Kapogianni's (2014) typology, where it is subsumed by *meaning replacement*. The sixth category is known in the literature as **verisimilar irony** and has been adopted entirely in our study. Finally, the last category is dubbed here **SAT-based**, yet it does not entail all speech acts

with the exclusion of assertives (as it does in Kumon-Nakamura et al.'s (1995: 19) pragmatic irony), but has been limited to Indirect Speech Acts realised by rhetorical questions. While skimming through the data at the pre-annotation stage, we had the impression that there were many cases of rhetorical questions, and hence, this speech act was distinguished as a separate group. In relation to this, a question discussed by Kumon-Nakamura et al. (1995: 19) *How old are you?* is classified as an ironic directive (i.e., *pragmatic irony*) since the addressee is not really desired to provide some information but rather he or she is reproached for behaviour that fails expectations/norms (e.g., being an adult but acting like a child). Contrary to this classification, in our schema, this question would be conceived of as a rhetorical question and thus would fall into the category of SAT-based irony. The approach followed here also diverges from Holdcroft's (1983: 502) *illocutionary irony*, which "subverts the entire ostensible speech act" and which would be treated here as sentential irony (rather than SAT-based). The example Holdcroft (1983: 498) discusses is based on the following sentence: *You are the cleverest person I've met – this evening, that is.* While no inversion is in operation in this sentence, it is still ironic due to the final (subverting) clause that "takes back what was apparently said".

While the paper does not have the ambition to propose a new typology of verbal irony, rather to simplify the existing categories and adjust them to naturally occurring, spontaneous and often (syntactically) imperfect online discourse of social media, some novel ideas have been implemented. The novelty lies in the fact that the types of irony employed in the schema in our data map the newer types (notably proposed by Kapogianni 2014) onto the more general, earlier considerations, and this entailed some terminological changes and definitional shifts in our schema described above. Contrary to what is proposed here, Kapogianni (2014) did not take into account the previous, more general division of propositional versus pragmatic irony (described, e.g., by Kumon-Nakamura et al. 1995). On the other

hand, Kumon-Nakamura et al. (1995) did not evoke some earlier solutions, such as Gibbs and O'Brien's (1991) verisimilar irony.

3. Material and methods

The data analysed in the present paper were retrieved from the Polish version of Reddit ("r/Polska"). Reddit is an example of social media; it was created in 2005. It is divided into thematic threads called subreddits, which contain original posts, comments to them and comments to comments, thus creating a tree-like organisation of content similar to the one on X/Twitter.

Since it is impossible to trawl through all Reddit posts and comments, we decided to focus on those contexts which meet the following criteria: (1) they are comments posted from January 2023 till April 2023; (2) they are comments to posts, treating the original submissions only as a source of contextual information for the comments, and (3) comments are labelled as sarcastic by the comments' authors (in line with the convention on Reddit it means using the "/s" tag).

Guided by Androutsopoulos (2018), we sampled the data by phenomenon, and in conformity with the grounded theory (Strauss and Corbin 1998), we started the selection with the first 50 comments within each month and continued gathering the contexts until we achieved theoretical saturation. Consequently, we gleaned over two hundred comments ($n = 255$), with, on average, over 60 per month (which constituted a vast majority of "/s" comments each month). The Redditors' classification was further manually verified by expert evaluators (three annotators and a super-annotator), and those which did not illustrate irony were removed, even if the comments' authors labelled them as sarcastic. 16 examples were removed from further analysis for various reasons (either they were too short, too obscure to be assessed, or did not exemplify irony/sarcasm); thus, the final number of comments added up to $n = 239$. We chose comments rather than posts, as we noticed the former were much more abundant in ironic/sarcastic language. Whenever a broader

context was needed to understand the ironic meaning of a comment, the original post was consulted. We categorised the extracted ironic contexts in terms of types of irony, its function and the predominant theme of a comment. The data garnered from Reddit come from four months (January-April 2023). They were next converted into a corpus (Irony on Reddit Corpus; henceforth, IRC), 4046 tokens in size, i.e., the raw dataset was lemmatised, tagged and parsed, which allowed further quantitative investigations. We used the Sketch Engine corpus management platform[5] in our analysis. A sentence-long comment was treated as the unit of analysis.

4.   Research aims and results

4.1. Aims

The study is framed by two overarching objectives. Aligned with the leitmotif of this thematic volume that explores methods of analysing texts expressing opinions, one of the goals of this study is to present a selection of computational methods germane to discourse analysis, mainly geared towards discerning opinions presented through ironic assertions or non-assertive sentences. With the aid of computational discourse analysis methods, the paper also seeks to uncover comments hidden in the sea of online discussions, e.g., elucidated by the concept of the "third space" (Ikas and Wagner 2009, Vochocová and Rosenfeldová 2019). Within this framework, ironic comments exemplify the efficacy of corpus-informed and computational methods to facilitate linguistics-oriented inquiries. In other words, the application of these methodologies will be showcased based on contexts gleaned from social media pertaining to irony.

The other aim is also to verify how and what types of opinions are encoded by verbal irony on Polish Reddit. Thus, the other objective of the study is to check what types of irony are

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[5] https://www.sketchengine.eu.

most common on Polish Reddit within those comments labelled by their authors as sarcastic. Along with the linguistic types of irony, we were also interested in other information related to ironic comments, such as the predominant themes of comments, the functions of irony and cognitive strategies (Bączkowska 2022b) used by Redditors to cope with ironic statements geared at them.

The limitation of this pilot study is that it does not disclose the types of irony in the entirety of the Polish Reddit but only on the material published within the four months, yet we believe that this part (based on data saturation methodology) filtered from Reddit can show certain tendencies.

In keeping with the two objectives, the following research questions (RQ) were pursued:

- (RQ1) What types of irony are predominant in the comments tagged as sarcastic (ironic) posted on the Polish subreddit in the IRC in the time range examined in this study?
- (RQ2) Is irony used primarily to express malicious and aggressive comments or jocular ones in the IRC (or other functions)?
- (RQ3) How did Redditors cope with aggressive/ridiculing comments in the IRC?
- (RQ4) Is the sarcasm identified in the subReddit in IRC used as a forum to express hostile or aggressive Redittors' personal opinions on self-initiated everyday topics or unpopular and politically incorrect opinions on current political or social issues?
- (RQ5) Which corpus and computational tools can be used to investigate these goals?

To answer RQ1 and partially RQ5, we mapped the typology of irony depicted in section 2 onto our data, the results of which are dissected in sections 4.2 (RQ1) and 4.3 (RQ5). Sentiment analysis and the Hate Speech analyser were, in turn, deployed to pursue RQ2 and RQ5 (section 4.5, section 4.6). The analysis of cognitive strategies (section 4.2.) checked how Redditors reacted to ironic comments (RQ3). As irony/sarcasm is a way one expresses negative opinions implicitly, we expected that the

sarcasm-related subReddit could be a place (the so-called "third space") where Redditors voice their concerns (political criticism, social issues, etc.) which they do not want to project straightforwardly. Hence, we analysed the predominant topics (section 4.2) of the comments and resorted to NLP-based topic modelling tools (section 4.3), word clouds and wordlists (section 4.6) in order to verify RQ4 and RQ5.

4.2. General overview of data

This section will present some general information about irony on Polish Reddit, such as the types of irony, its functions, reactions to ironic comments, and the topics touched upon in them.

4.2.1. Types of irony

The first aspect to be analysed is the type of irony. The analysis followed a multi-step decision tree (visualised as an algorithm-based flowchart), which guided annotators regarding the type of irony used in a comment. The results show that lexical irony is the most frequent type, which occupies ca. 50% of the IRC data.
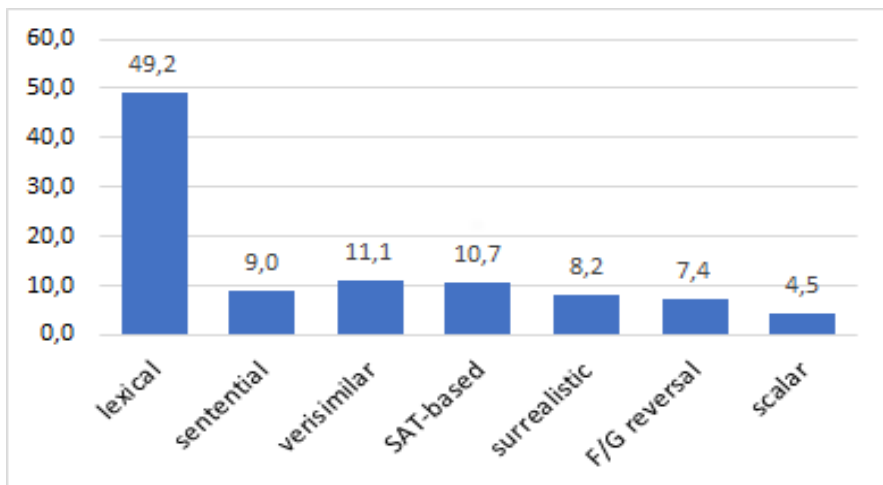
Figure 1
Types of irony in percentages in the IRC

Much less common is verisimilar irony (ca. 11%), SAT-based (almost 11%), sentential irony (ca. 9%), surrealistic (over 8%), and figure/ground reversal (nearly 7.5%), while the least popular is scalar irony, with the occurrence equal to 4.5%.

SAT-based is illustrated by Figure 2a. A negative comment that Szymon Hołownia (the leader of a centrist political-social movement) made regarding LGBT marriages was commented on by a Redditor (Eng.: "Anti LBGT but at least pro pedo"). This opinion was, in turn, commented on by another Redditor who resorted to an ironic rhetorical question: *A to nie to samo?* (Eng.: "Isn't it the same?"). SAT-based irony resorts in this study to an overtly insincere interrogative, which is sufficiently obvious in its insincerity to make the reader/addressee convinced that he or she is exempt from committing to answering it. The poster does not expect any reply to the question he or she is soliciting inasmuch as the question functions as a form of one's tacit expression of personal assertion, i.e., opinion, through non-assertoric utterance.

Lexical irony in Figure 2b premises on word-based contradiction (lexical meaning opposition), which in the elliptical comment *Rosja taka dobra <3* (Eng.: "Russia [is] so good, <3") relies on the word *dobra* ("good"). This untrue assessment (a concluding assertive) is reinforced by the emoticon symbolising the heart ("<3") and the emoji with two hearts in place of eyes, both of which signify happiness. The ironic overtone suggests that the adjective signifies bad, evil, and hostile intentions. The comment relates to a discussion on purchasing Ukrainian grain, which endangered the economic situation of Polish farmers. Against this situation, apparently, the Russian opposition warned Poland that a realistic problem could take place in the near future. While the antonymic lexical replacement of *dobra* ("good") necessarily entails inversion in the propositional meaning, such cases are not treated as examples of sentential irony here as the source of the reversal of meaning resides in single lexemes (and thus are at sub-sentential level).
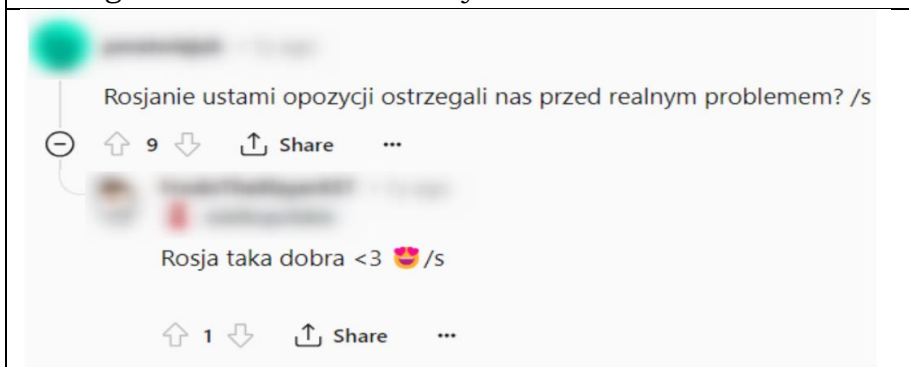
Figure 2a. SAT-based irony
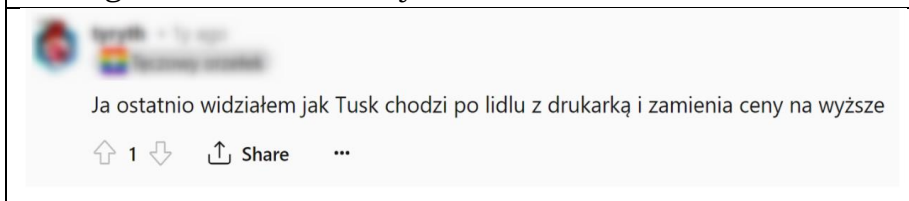

Figure 2b. Lexical irony
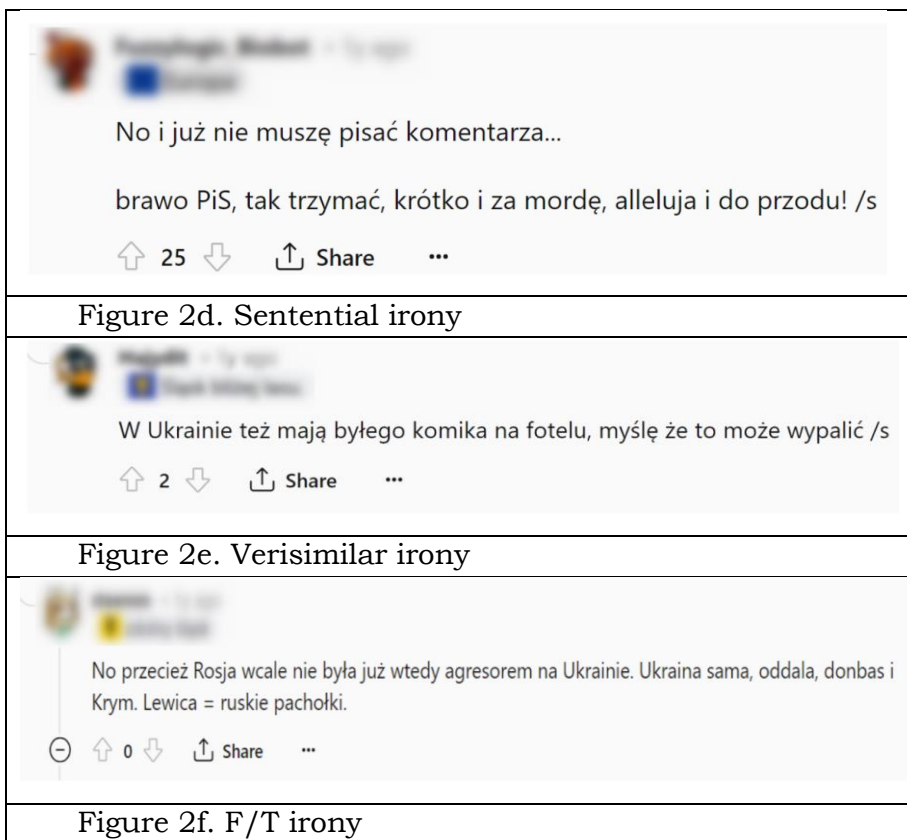

Figure 2c. Surrealistic irony

Figure 2d. Sentential irony

No i już nie muszę pisać komentarza...

brawo PiS, tak trzymać, krótko i za mordę, alleluja i do przodu! /s

25 ⬆ ⬇ ⬆ Share ...

Figure 2e. Verisimilar irony

W Ukrainie też mają byłego komika na fotelu, myślę że to może wypalić /s

2 ⬆ ⬇ ⬆ Share ...

No przecież Rosja wcale nie była już wtedy agresorem na Ukrainie. Ukraina sama, oddala, donbas i Krym. Lewica = ruskie pachołki.

0 ⬆ ⬇ ⬆ Share ...

Figure 2f. F/T irony

Figure 2
Types of irony in IRC

An absurd situation in turn is depicted in Figure 2c: *Ja ostatnio widziałem jak Tusk chodzi po lidlu z drukarką i zamienia ceny na wyższe* (Eng.: "I have recently seen Tusk walking around lidl with a printer and changing the prices for higher ones"). Tusk, currently the Prime Minister, was the leader of the opposition movement at that time. The Redditor cited here commented on a discussion described by another Redditor who overheard a preposterous conversation in Lidl (a German discount retailer chain) between two older clients (a woman over sixty and a man over seventy, according to the commentator). The woman claimed that the extortionate prices in shops were purposefully

raised to discredit the Law and Order party, which was at the helm at that time. The irony thus spreads over the whole sentence, and it consists in apparent agreement with the cited woman overheard by stealth inasmuch as the poster provides an argument coinciding with the woman's suspicions voiced in the preceding turn. Yet the argument is absurd and unbelievable, which makes the comment a blatant irony contingent on a blunt negative evaluative implicature of the antecedent.

An expressive encoding of emotional praising and congratulations spanning the whole sentence is shown in Figure 2d (*brawo PiS, tak trzymać, krótko I za mordę, alleluja I do przodu!*, Eng.: "well done PiS, keep it up, get them by the short and curlies, hallelujah and move forward!"). The irony here is encapsulated at the sentence level, i.e., the meaning reversal holds for the contradiction of the speech act of praising (criticising) and the reversal of congratulations (disapproval, condemnation)[6]. Thus, the inferred meaning hinges on a pragmatic reversal (of illocutionary force). The poster of this comment is therefore appreciative of the Law and Peace party ("PiS") only on the surface, at the what is said level, since the implicature communicates that the party is an object of ridicule whereby the measures employed by its members are negatively evaluated.

Scalar irony is the least popular type of irony found in our dataset. The comment *Pewnie. Kto by się przejmował takimi pierdolami, am I right?* (Eng.: "Sure. Who would bother with such bullshit, am I right?"), which we recorded in our Excel spreadsheet before the comment was deleted by the account owner (hence no screenshot is provided here), realises the scalar irony by dint of the word *pierdoły* ("bullshit"), which in Polish designates things of little importance. The irony resides in a purposeful opinion expression that belittles the object of description. The discussion in the thread from which the comment

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[6] While changing pragmatic meaning based on the reversal of illocutionary force (such as thanking, congratulating, etc.) entails shifts in (or the reversal of) speech acts, such cases are not counted here as SAT-based examples; the latter are reserved for rhetorical questions.

was deleted revolves around the danger of contracting a venereal Infection while using the services of prostitutes. The danger is not denied, yet the potential consequences of catching a disease are diminished.

A truthful statement and implicature rooted in its meaning reversal is generally expected in verisimilar irony, which can be illustrated by Figure 2e (*W Ukrainie też mają byłego komika na fotelu, myślę że to może wypalić*, Eng.: "In Ukraine, they also have a former comedian in the chair, I think it might work out"). In line with the verisimilar irony, it would seem reasonable to assume that the Redditor communicates what he believes to be true, i.e., that the president of Ukraine is an ex-comedian (which is common knowledge) but even so, he is doing fine as the president now (which is his widespread assessment in the news media). The meaning of the second part of the sentence is signalled implicitly as it is not stated straightforwardly in the sentence: *myślę, że to może wypalić* (Eng.: "I think it may work out"). This fragment refers to the Polish context by implicitly making a comparison with the successful Ukrainian context. The (seemingly genuine) contention that having a comedian at the helm in Poland could bring good results pivots on the unspoken assertion that the Ukrainian president achieved success holding the high office. Given the previous argumentation in the thread and the use of the word "clown" in lieu of "comedian", it can be safely assumed that the author ironically and tacitly implies his disbelief rather than belief in a successful Polish government. The reader uncovers the intended (critical) evaluative implicature by referring to antecedent turns in the thread, as irony is a negative evaluation assessed against a previous utterance (Kumon-Nakamura et al. 1995, Kapogianni 2014). The suspicion of an ironic intent can also arise from the discord between the apparently positive assessment of the situation described in the sentence and, at the same time resorting to words which sound somewhat unfavourably and suggest a negative evaluation (negative implicature), such as *komik* ("comedian"), instead of "actor", for example, and *na fotelu* ("in the chair"), in lieu of, say,

"in the government", which function as clues for non-literal interpretation. The latter has particularly strong connotations in Poland with the pejorative phrase *na stołku* ("on the stool"), which signifies some behind-the-scene arrangements and deals with influential people, e.g., politicians, in order to obtain a good, influential job (as in *posadzić kogoś/siedzieć na (wysokim) stołku*, "put somebody/sit on a (high) stool". The evaluation is "true seeming" (Partington 2007: 1561) here rather than truthful. The whole sentence reflects a true contention regarding Ukraine, but what it asserts creates a clash with the contextual situation incompatible with Polish political life (according to the discussants). The negative evaluation is implicit yet, at the same time, sufficiently obvious (explicit) for a reader to notice the author's disbelief encoded by a sentence that, on the surface, voices only a truthful opinion. What the Redditor believes to be true in the first part of the sentence does not tally with his (implied) disbelief of its realisation relative to the specific (Polish) context expressed in the second part. The assertion *myślę, że to może wypalić* (Eng.: "I think it might work out") thus unveils a lack of belief, whereby the speaker implies that what he says is, in fact, untrue. The Gricean maxim of Quality is observed here, i.e., it predicates on what is said; however, it seems to rely on truthfulness only to some degree as the absolute truthfulness of the whole sentence is hardly tenable.

One of the least frequent types of irony identified in our data is F/T irony, i.e., a comment capitalising on figure/ground reversal (Polish: *figura/tło*, hence F/T). In Figure 2f (*No przecież Rosja wcale nie była już wtedy agresorem na Ukrainie, Ukraina sama, oddała, Donbas i Krym. Lewica = ruskie pachołki*, Eng.: "Well, but Russia wasn't the aggressor in Ukraine at that time, Ukraine itself handed over Donbas and Crimea. The Left = Russian lackeys"), the Russian occupation of the Ukrainian Crimean peninsula in February 2014 is presented as if the annexation of Crimea by the Russians was not an act of Russian aggression and a military attack on the sovereignty of Ukraine but as a result of voluntary submission to Russia initiated by

Ukrainians, as if Ukraine invited Russia to occupy some of its territories. The optics are thus shifted from Russian aggression to the false claim of the Ukrainian wish to become a part of Russia. The Russian aggression (figure) on Ukraine (ground) is reversed so that Ukraine is put to the fore (figure) and Russia is backgrounded (ground).

4.2.2. Functions of irony

Three functions (Figure 3) were considered for the study: jocular, malicious and praising or complimenting[7] (P/C). As mean comments are often jocular at the same time, we subsumed malicious jocularity under the rubric of jocularity. On the other hand, mean comments with no jocular overtones were treated as malicious. P/C can also be a carrier of jesting meaning; thus, a comment was classified as praising/complimenting regardless of whether or not it was also amusing. We assumed that ironic P/C is unlikely to be a genuine appreciation, and this untruthfulness tends to be expressed through amusement. Jocular comments were thus those which, while conveying comic effect, could also be malicious but not praising/complimenting. The majority of comments display (maliciously) jocular function (over 70%), and malice takes up only one-fourth (26%) of all functions. The least common manner of expressing irony was through P/C (almost 4%).

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[7] Complimenting refers to a present and ratified addressee while praising to an absent addressee (the third party).
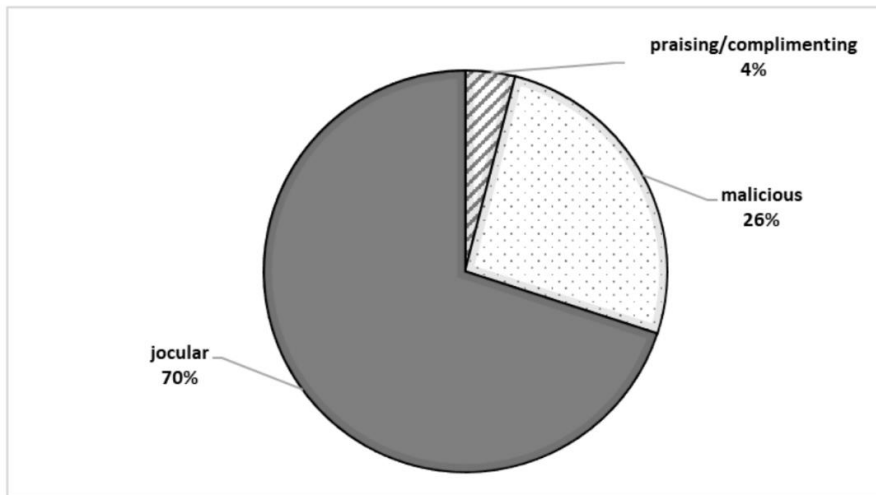
Figure 3
Functions of irony in IRC

Figure 3a demonstrates the malicious function of irony expressed through two statements. The first one (*Nie słyszałeś?*, Eng.: "You haven't heard of it?") is an example of SAT-based irony, and the second one is a negation-based malicious comment about women who apparently do not experience any problems with relationships (*Problemy kobiet ze związkami nie istnieją*, "Women's problems in relationships are non-existent"). The sentence above is a reply to a previous comment, and it says *Jakże mnie to nie dziwi* (Eng.: "How unsurprising that is to me").
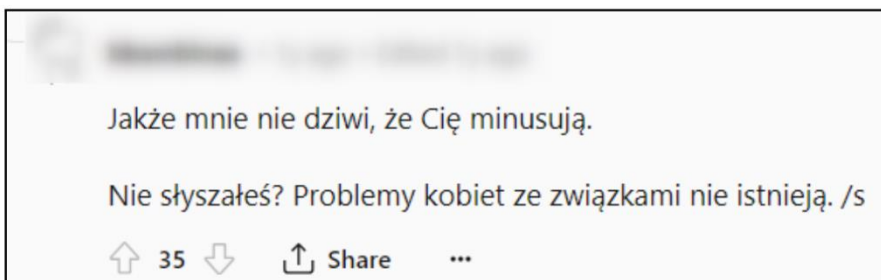
Figure 3a
Malicious irony

In a discussion about a raped 14-year-old who was refused an abortion by physicians based on invoking the conscience clause (Figure 3b.), two Redditors express similar opinions ironically. The first comment says that *Rodzina to rzecz święta* ("Family is a sacred thing"), which is supposed to justify the rapist who should be treated like a family member.
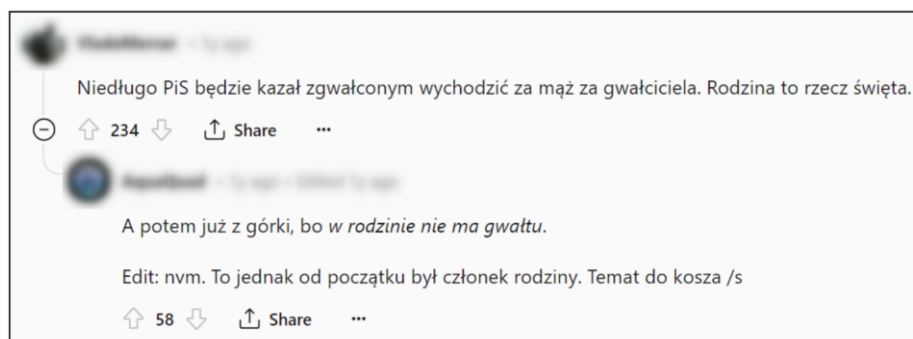
Figure 3b and 3c
Malicious irony

This "opinion" stems from the fact that, as the Redditor ironically claims, soon the Polish right-wing party Law and Order ("PiS") will make the rape victims marry their predators (*Niedługo PiS będzie kazał zgwałconym wychodzić za mąż za gwałciciela. Rodzina to rzecz święta*, Eng.: "It can be soon expected that PiS will be ordering the raped to marry the rapist"). PiS is known for its strong support of the Polish Christian Church, both in terms of legal solutions and exceptionally high subsidies, as well as for anti-abortion law and generally anti-women approach. The comment thus is suggestive of the primacy of (unborn) life even over legal offence, which ridicules the government (dominated by the right-wing party at that time) that acquits the perpetrator and blames the (woman) victim. The other Redditor (Figure 3c) adds *A potem już z górki, bo w rodzinie nie ma gwałtu* (Eng.: "A smooth sailing from then on because there's no rape in the family"), with a self-repair (*Edit: nvm. To jednak od początku był członek rodziny. Temat do kosza*, Eng.:

"Edit, nvm. *He was, however, a family member from the begin-ning. Forget about it*"). The effect is precisely the same, i.e., the rapist is seen as a family member with all the blame put on the victim, which is an obviously ironic comment (given that Poland is a primarily catholic country).

In Figure 3d., the second statement (*Faktycznie, brzmi rozsądnie*, "Actually, it sounds reasonable") is a lexical irony wherein the word *reasonable* indicates its opposite meaning (*un-reasonable*, *absurd*, *stupid*) relative to the context introduced before, which criticises parking places built away from residen-tial buildings (*Żeby stworzyć paskudne place parkingowe zami-ast parkingu przy drodze dojazdowej do budynków?*, Eng.: "Cre-ating ugly parking spaces instead of a parking place by the ac-cess road to the buildings?").
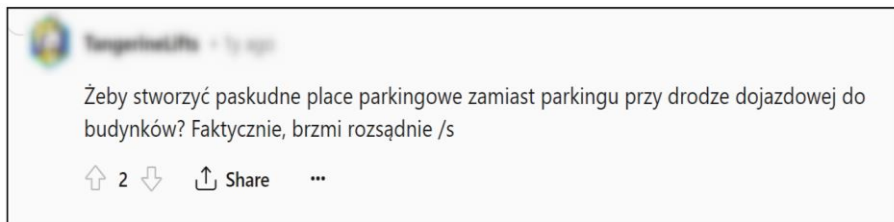
Figure 3d
Praising/complimenting irony

A mild humorous overtone is noticeable in the next example of (sentential) irony in Figure 3e: *W wieku rozrodczym i nie znać Harry'ego Pottera. Wstyd* (Eng.: "Being in the childbearing age and not knowing Harry Potter. Shame"). Obviously, it is no shame if one does not know the characters and the books about Harry Potter written for children, even though they were world bestsellers. The irony is highlighted by *Wstyd* ("Shame").
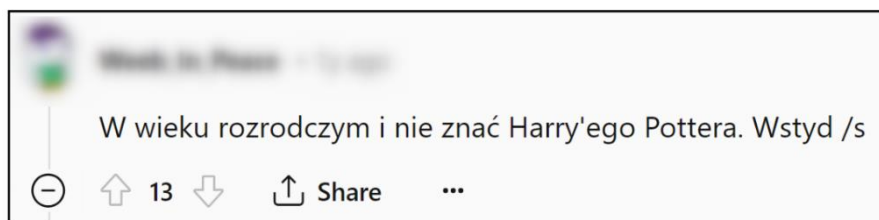
Figure 3e
Jocular irony

In Figure 3f, the post makes reference to the parliamentary elections in Poland in 2023, when the Catholic-nationalist party (Sovereign Poland) deputy, Janusz Kowalski, convinces that Poland does not need to be supported by NATO in the context of the Russian aggression on Ukraine in 2022 and a potential military attack on Poland (*Wybory 2023. Janusz Kowalski przekonuje, że Polska nie potrzebuje NATO*, Eng.: "Elections 2023. Janusz Kowalski convinces that Poland does not need NATO").
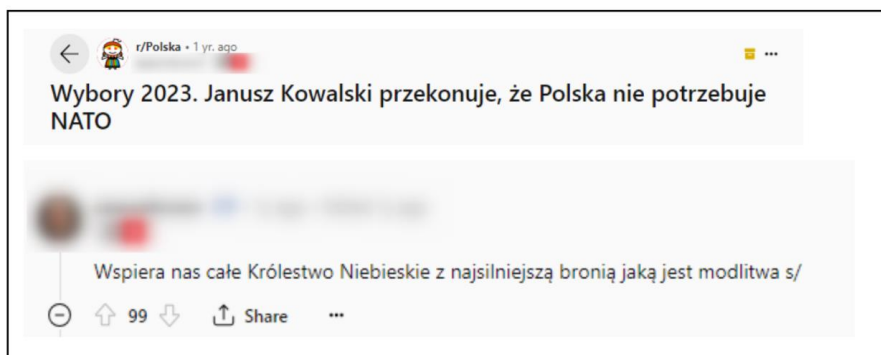
Figure 3f
Malicious jocular irony

Apparently, the comment to this post is conducive to this assertion by adding an argument endorsing the view expressed by the post: *Wspiera nas całe Królestwo Niebieskie z najsilniejszą bronią jaką jest modlitwa* (Eng.: "The entire Kingdom of Heaven supports us with the strongest weapon, which is prayer."). The absurd source of defence is unconvincing. It is built on humour

(through obvious references to the predominating catholic religion in Poland) and ridicules the deputy's opinion.

4.2.3. Reactions to ironic comments

The way addressees of comments or commentators reacted to previous comments varied. They could be directed to the interactant (the author of a comment or authors of comments to the original comment), towards a third party, objects or events, or could be self-directed. Figure 4. manifests that the predominant strategy in our data is criticism levelled towards the third party (over 47%), followed by criticism of objects and events (almost 37%). Direct criticism of the addressee is relatively rare, up to nearly 13%, while self-criticism is rare (less than 3%). From this, it transpires that irony is used here to express opinions about a non-individual referent (third party, institutions, things or events) rather than attack a single addressee.
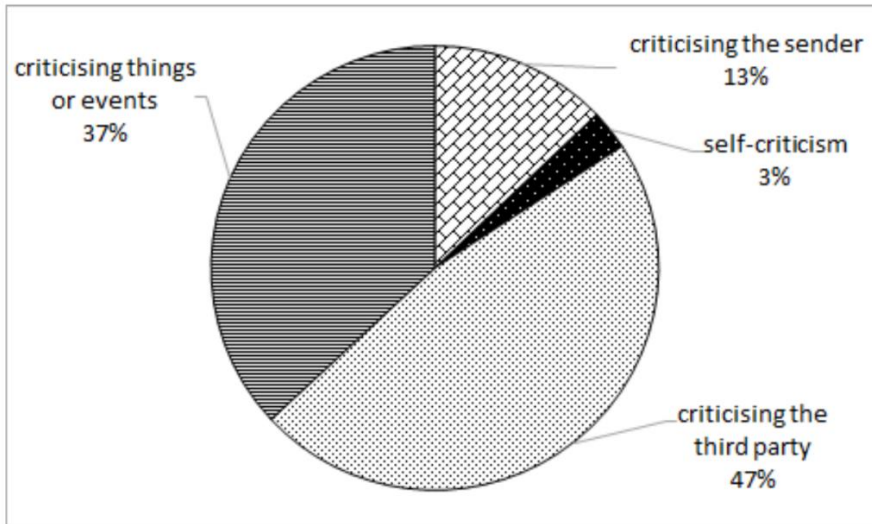

Figure 4
Cognitive strategies used in reactions to ironic comments in the IRC

In Figure 4a (*Przecież za inflację odpowiada Tusk z minimalną pomocą Putina, rząd robi co może dla tych uciemiężonych rentierów*, Eng.: "After all, Tusk is responsible for inflation, with minimal help from Putin, the government is doing everything it can for these oppressed rentiers") the ironic criticism is elaborated by the word *uciemiężonych* ("oppressed") and targeted at *rentierów* ("rentiers"). The modifier of *rentiers* is an obvious lexical, opposition-based irony, wherein the comment's author suggests that rentiers are privileged rather than oppressed.
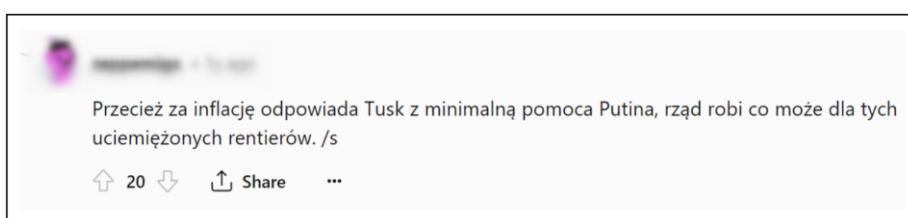
Figure 4a
Ironic criticism of the third party

From the discussion on Reddit, which precedes this comment, it transpires that the word *rentiers* alludes to the relatives and/or accomplices of government members publicly accused of making enormous illegal investments. The criticism is embedded in the context of inflation, for which Donald Tusk is claimed to be accountable, with the help of the crisis caused by Putin's military invasion (as the Russian invasion of Ukraine in 2022 was often claimed to be responsible for high inflation in Poland in 2023). By the same token, the government, dominated by the right-wing party Law and Order at that time, is cleared of charges. The third party here is the group of oppressed rentiers, as well as the right-wing government. In this comment, irony extends over the whole sentence, inasmuch as the claim is stated that the current government does whatever possible to alleviate the "rentiers' plight".

The following example (Figure 4b) is a comment which tacitly criticises the previous poster who playfully calls for legal

action targeted at those (most probably women) who make a shopping list for men exceeding ten items, as each of the items is to be sought among millions of similar ones. The author of this post was Robert Winnicki, ex-MP from the nationalist party Confederation. His post was framed by another Redditor who attacked the ex-MP on the grounds that he could not cope with doing shopping but wanted to rule a 40 million people country (*facet nie radzi sobie z zakupami a chce rządzić 40 milionowym państwem*; "A man struggles with doing the shopping and wants to govern a country of 40 million people").
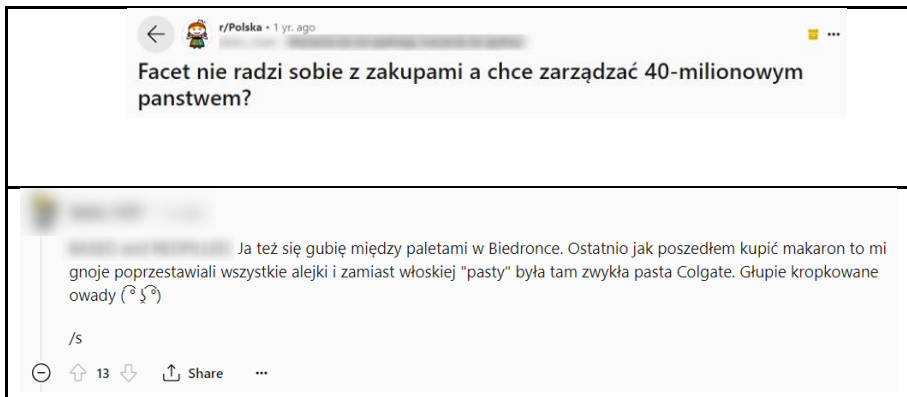
Figure 4b
Ironic criticism of an individual

In reply, another poster writes: *Ja też się gubię między paletami w Biedronce. Ostatnio jak poszedłem kupić makaron to mi gnoje poprzestawiali wszystkie alejki i zamiast włoskiej 'pasty' była tam zwykła pasta Colgate. Głupie kropkowane owady* ("I also get lost among the pallets at Biedronka. Recently, when I went to buy pasta, the bastards rearranged all the aisles, and instead of Italian "pasta", there was regular Colgate toothpaste. Silly polka-dotted bugs"). The comment is humorous but, at the same time, ironic. The irony is built on a seeming agreement with the ex-MP's comment ("I also get lost among the shelves at Biedronka"), who claims to have exactly the same problems with finding his way at one of the biggest and most popular chain

shop in Poland, a Portuguese retail network Biedronka ("Lady-bird"). To prove his point, he provides an example of trying to buy Italian pasta the other day and being unable to find it. This agreement is reinforced by the last sentence ("Silly polka-dot bugs"), which, however, betrays the non-seriousness of the author's self-critical comment (emphasised by the Lenny face emoticon signifying surprise added at the end of the sentence). This underestimates and reverses the previous argumentation, which makes the whole comment an ironic and humorous one targeted at the inapt politician who is thus ridiculed.

Finally, a counter-example is presented below by means of the next comment to illustrate cases excluded from this analysis. Self-criticism (i.e., directed towards an individual) is discernible in Figure 4c, wherein in multimodal comments, pictorial elements are involved together with verbal communication. The Redditor admits that s/he purportedly has no friends. The original Redditor to which the comment is made shows three glasses of wine; one represents a glass typically filled in a restaurant (glass on the left), the other one filled at home by the host for guests (glass in the middle), and the last one (on the right) filled by the host for himself when nobody can see him so that he does not need to go to the kitchen twice. The question posed in this post (above the picture) is *U Was w domu też tak jest?* (Eng.: "Is it like that at your homes as well?").

The answer to this question is jocular, yet contrary to what one may think at first glance, it is not ironic. It premises on the underlying argument that if one has friends, they drink wine together from a glass, i.e., in a sophisticated manner; otherwise, the host drinks it on his own straight from the bottle. This form of indulgence testifies to the feeling of loneliness of the drinker, which can be a source of distress. Drinking alcohol straight from the bottle is also commonly associated with people from lower social strata, often low-paid or unemployed. The reply transparently fosters the playful tone by resorting to an obviously untrue statement involving self-criticism couched in humorous self-denigration (Matwick and Matwick 2017), as the Redditor con-

trives himself as a lowlife butt: *Ha ha, tak, tylko wszystkie trzy kieliszki są u mnie w kuchni, a piję z butelki bo nie mam znajomych* (Eng.: "Ha, ha, ha, yes, all three glasses are here in my kitchen, and I'm drinking from the bottle because I don't have friends").

Figure 4c
Jocular self-criticism

Essentially, the comment meets the requirement stemming from the Gricean definition of irony, which is the reversal of meaning (at all likelihood, the poster does not conceive of himself as lonely). However, it fails to obey the second condition of expressing hostility and derogation by indignation or contempt towards the addressee (Grice 1989: 53)[8]. The poster of this comment voices his/her ingenuine opinion about himself/herself, as it seems, solely for the sake of amusement, i.e., achieving a humourous effect, without the intention to criticise or demean the author of the question stated above the glasses of wine in Figure 4c. The relatively unmarked (compared to the comment) information about manners of drinking wine declared by the author of the post is followed by a marked one as the comment unfolds, with the humorous confession (the punch line) placed at the end of the comment. According to Giora (1995: 256-257), this direction in the shift of markedness aligns with the well-formedness of jokes and its reversal from the marked constituent, i.e., purposefully used overt camouflage, to the unmarked (the uncovering of the expected interpretation) is typical of irony. Moreover, in jokes, in the process of meaning retrieval, cancellability of the first element is possible, i.e., the import of the humorous content does not necessitate a comparison with the antecedent (which is the case of the comment in Figure 4c), whereas the discovery of ironic overtone relies on the juxtaposition of the literal and the non-literal reading based on which the ironic content is computed. Given these necessary conditions, the example in Figure 4c is illustrative of jocularity rather than irony. This example shows which cases were not included in our study and that the distinction between jocular irony and sheer humour devoid of evaluative implicature is not always obvious and easy to capture at first glance. It also signals the possible discrepancies between the laypersons' understanding of the

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[8] However, as mentioned above, Kumon-Nakamura et al. (1995: 4) notice that hostility is not the necessary condition for irony.

term irony/sarcasm (the comment was tagged "/s") and the academic definition.

Irony revolving around an event/thing is embodied by the comment in Figure 3c and 3d, wherein the institution of family (Figure 3c) and public roads construction authorities (Figure 3d) are implicitly attached through ironic opinions referring to events (of a rape and road building). On the other hand, in Figure 3a, an individual is the referent of the ironic comment.

Types of irony, functions, and strategies were checked for possible correlations, yet no statistically significant correlations were found, which could stem from the sample size.

4.2.4. Topics

We manually distinguished the following main topic categories (Figure 5): society (including everyday life, family, language and communication, children, etc.), discrimination, politics and war, health and ecology, relationships, religion, finances and work, and hobby. The most popular topics comprise social and everyday issues; the second category of the most frequent topics is politics/war.
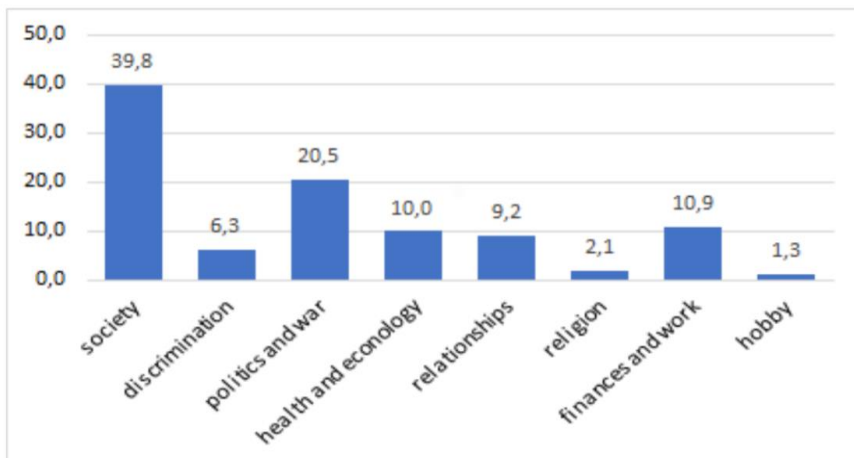

Figure 5
Most frequent topics in percentages in the IRC

4.3. Topic modelling

We analysed topics of all comments as we wanted to check whether subReddit devoted to sarcastic comments is a virtual space wherein Redditors express their opinions on personal issues and in a self-initiated fashion or whether it is also a place where socio-political reality is reflected, projected, contested, and rearticulated, where discussions also revolve around ideologies, discrimination, repression inter alia. Thus, to complement the topics identified manually (Figure 6), automatic topic modelling was implemented (clarin-pl.eu[9]) with the aim of disclosing some less obvious problems detected by NLP (Mallet tool[10]). In other words, we wanted to check whether a topic suddenly pans out on the margin of the main discussion. We set the system to identify 15 main topics, all of which proved to be present with a comparable frequency (Figure 6). The most common concept words in the topics identified by the NLP tool are *człowiek* ("the human being"), *dziecko* ("child"), *kobieta* ("woman"), and *problem* ("problem").

While most of the topics seem to be of similar importance and without a substantial predominance of one over others (a cluster of points on the left-hand side), delving deeper into the corpus allows noticing that two topics stand out (on the right-hand side) from the main discussion (Figure 7). One of them revolves around the problem of Ukraine, around 0.3 value, and the other one is associated with social issues, the point around 0.6 value on the x-axis. The method of similarity extraction in Figure 7 is reliant on the cosine distance measure and the Multi-dimensional scaling method (MDS, Kruskal 1964). More details reveal the word clouds (Figure 8).

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[9] Clarin.pl is the Polish branch of a scientific consortium created in 2012 (Common Language Resources and Technology Infrastructure) as part of a European scientific digital infrastructure, which offers services, tools and language resources.
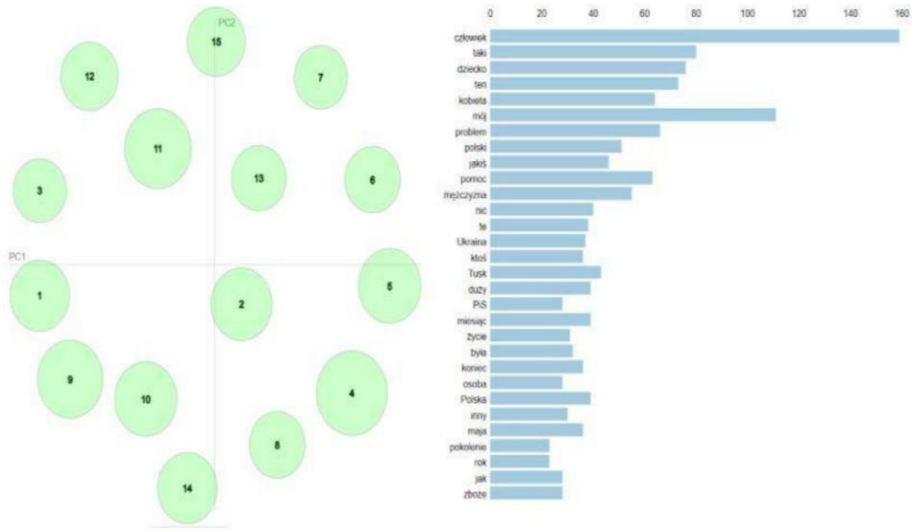
[10] Machine Learning for Language Toolkit (https://ws.clarin-pl.eu/topic).

Figure 6
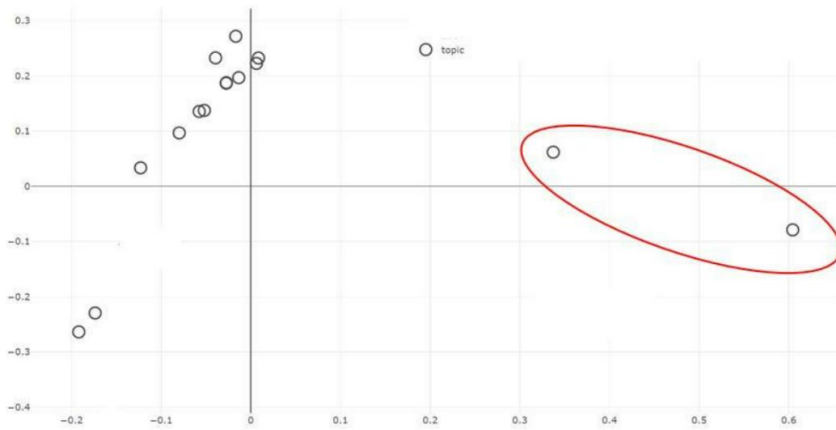Topics in the IRC automatically identified by the Mallet tool

Figure 7
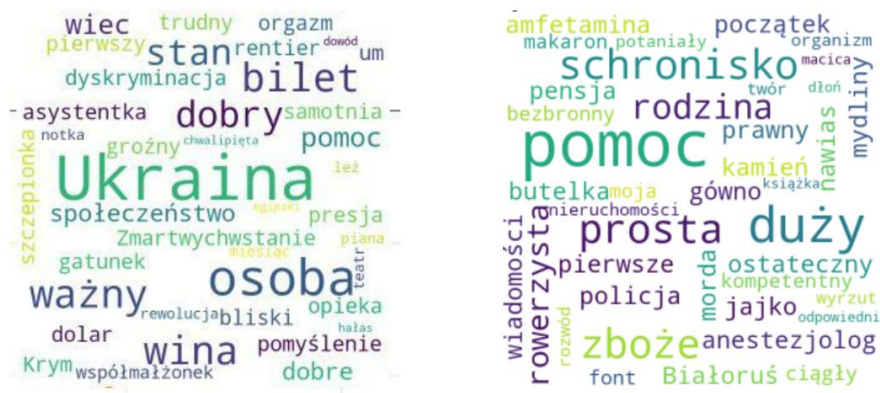Cosine similarity among topics (MDS) in the IRC

Figure 8
Word clouds for two peripheral topics in the IRC

The first topic contains the following words: *Ukraine*, *person*, *important*, *fault*, *good*, *ticket*, *state*, *society*, *help*, *Crimea*, *care* (noun), *dangerous*, *discrimination*, *difficult*, *spouse*, etc. A close examination of contexts shows that they refer to the Russian-Ukrainian war. The second word cloud is made up of the following words: *help*, *big*, *shelter*, *grain, shit, legal, salary*, *cyclist*, *news*, *soap suds*, *bracket*, *helpless*, *police*, *Belarus*, *amphetamine*, etc. It ridicules Belarus and touches upon some common social issues. The topics identified by the automatic classification software are not fully fledged; thus, while indicating some thematic trend appearing in the discussions, they cannot be treated as a complete description of the 'third space' topics in this study. It seems, however, that a post-pilot investigation based on a larger dataset could provide promising outcomes.

4.4. SAT-based ironic comments

SAT-based irony frequently relies on deploying an interrogative to encode a statement or request/command. The number of occurrences of the question mark character adds up to 62 occurrences (i.e. over 15 thousand per million tokens). These contexts

are evenly distributed (Figure 9), which speaks for the interrogative being relatively systematically used in our data and that the language on Reddit is rather emotional. While not all interrogatives display ironic overtones, after some calculations, it turned out that eight out of ten interrogatives are, in fact, ironic.
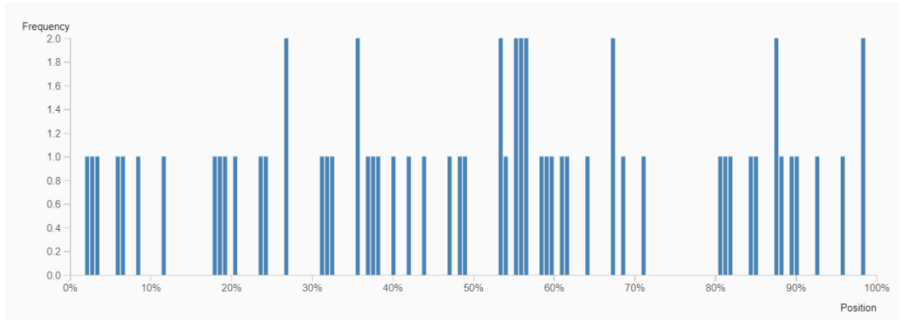

Figure 9
Distribution of the question mark in the IRC

4.5. Hate speech

The texts were checked in terms of containing language typical of hate speech using the online tool available on the Polish Clarin website (https://ws.clarin-pl.eu/hatespeech[11]). The result shows that over 70% of the texts exemplify hate speech (Figure 10) in the general mode. However, it was almost the same when checked for low-sensitive and medium-sensitive models and similar for the personalised model. In all modes, aggressive language prevails; even though, the predominant function is jocularity (over 70%; Figure 3). Therefore, in our data, irony conveys a high level of aggressive language mitigated by the jocular overtone.

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[11] Regrettably, whilst the tool seems very useful for studies on abusive language, its developers have not provided the users with any description of the algorithm underlying the software.
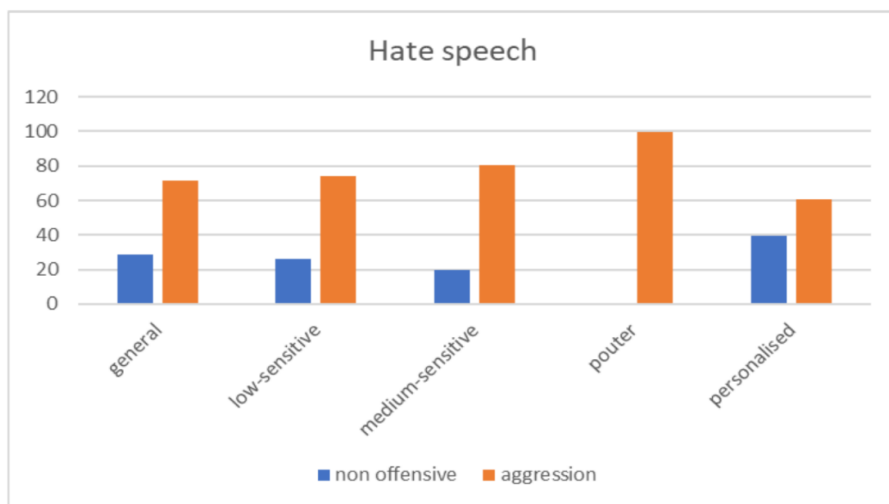
Figure 10
Percentage of hate speech in the IRC

4.6. Sentiment analysis

Sentiment Analysis (SA; Clarin) indicates text polarity. In our study, SA shows a slight predominance of the negative sentiment. The positive sentiment embraces "joy", "trust", and "happiness" triggered by something unexpected, whereas the negative sentiment revolves around "sadness", "anger", "fear", "hate", and "surprise caused by something unexpected". Since irony is typically associated with negative evaluations, we checked select words illustrating the positive sentiment to verify the contexts. One of the highest positive sentiments is associated with the emotion "happiness", which is almost as frequent as "anger" (Figure 11). The ironic comments that operate on opposition thus rely mainly on the emotion of false joy.
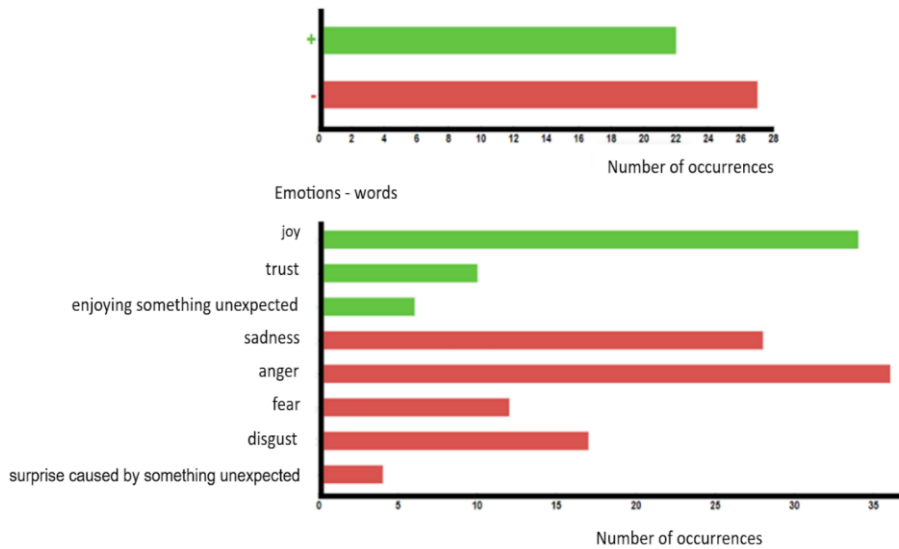
Figure 11
Sentiment analysis results for the IRC

However, a closer inspection shows that the context with words assigned to "joy" is both ironic and jocular (Figure 12). For example, "joy" can be expressed by the verb "cieszyć się", and as the context below shows, it is not used literally ("This young generation takes things for granted, we worked for free and, still, one was happy that there was work").
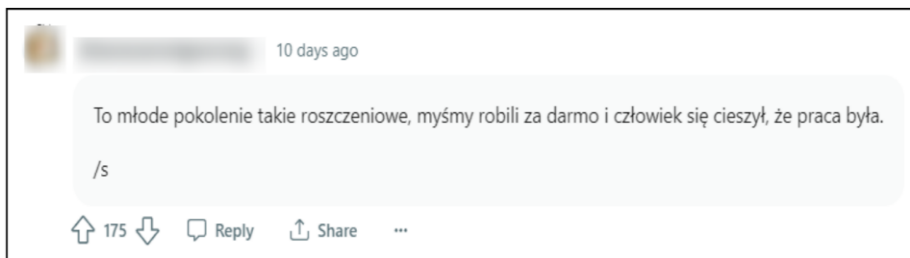

Figure 12
Sample from Reddit to illustrate the positive
sentiment emotion "happiness"

Another way to encode positive emotions, such as "joy" or "being happy about expected", is to resort to the adjective *dobrze* (Eng. "well"). As the concordances below (Figure 13) demonstrate, of the eight examples with the lemma *dobrze*, 6 express obvious irony.
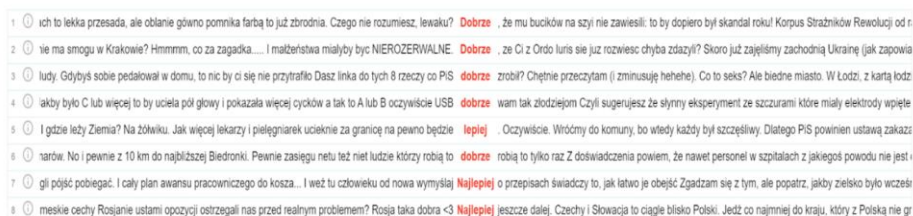

Figure 13
Concordances with *dobrze* retrieved from the IRC

4.6. Wordlists

Four wordlists were generated, which illustrate the frequency of all words (Figure 14). The ALDF (Average Logarithmic Distance Frequency) was calculated in lieu of absolute frequency (F) as it takes into account whether a word is equally spread across the corpus. Unlike ALDF, a similar parameter - ARD - is less precise as it divides a corpus into equal parts and checks for multiple occurrences within each fragment, ignoring those parts with zero occurrences. ALDF is based on the calculation of distances between words, and thus it prevents the high occurrence of a word appearing only in a small fragment of a corpus. Compared to F, the nouns *woman* and *problem* have a slightly more significant occurrence in select parts of the data. The incidence of the noun *man* is suggestive of appearing only in a limited number of comments, thus showing a higher uncertainty in its *commonness* (Savický and Hlaváčová, 2002). These observations can indicate a sudden rise of a potential topic typical of the "third space" on the internet, wherein politically or socially sensitive issues are spontaneously expressed or purposefully trig-

gered on the margin of the mainstream discussion. In this study, the topic revolves around men and women (and gender-related problems).
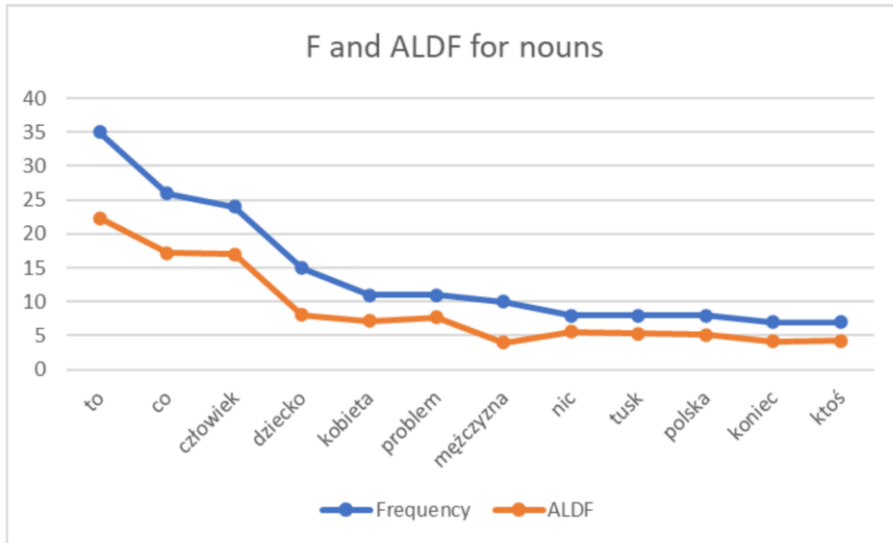

Figure 14
Absolute frequency vs ALDF in the IRC

The highest position in the general list is occupied by *to* ("this/it"). The Polish *to* can be ascribed several roles, such as the demonstrative, which may refer to extralinguistic concepts or nominals mentioned earlier in a text; the latter functions as a cohesive marker. It can also be the so-called dummy *it* or have some emphatic functions. By resorting to the pronoun functioning as a cohesive marker, the users made reference to opinions expressed by other Redditors in existing comments (ca. 10%); thus, its use speaks for some interaction occurring among commentators. In favour of their interaction, there is only a sporadic occurrence of stand-alone comments (ca. 1%), i.e. left unattended by Redditors.

The pronoun-noun ratio (PNR) is claimed to be a reliable index of text cohesion and good-quality text. In our data, the PNR is 7.7%; to compare, in narratives, it oscillates around 20%

(Klamer and Moro, 2019), while in data gleaned from internet fora, it oscillates around 4.8[12]. The PNR partially bolsters the observation regarding interaction. It reveals a higher score than in another social media form (fora) and suggests a minute number of stand-alone posts. The following personal pronouns and possessive adjectives prevail (number of words per million in the brackets): *ja* ("I"; 4.5), *my* ("we"; 2.7), *ty* ("you"; 2.7), *nasz* ("our"; 1.5), *twój* ("your"; 1), *mój* ("my"; 0.74), together with some reflexive pronouns *siebie* ("your/him/herself"; 2.2), *sami* ("them/ yourselves"; 2.2). Such a result, especially the pronouns "our", "we", "them"/ "yourselves", may suggest that Redditors tend to express their personal opinions on behalf of a group they identify with. Furthermore, expressions referring to the second-person singular or plural relate to what the preceding speaker/ writer wrote, which speaks for some interaction.

The most popular nouns encompass *człowiek* ("the human being"), *dziecko* ("child"), *kobieta* ("woman"), and *problem* ("problem"), which converge with the identification of most common concepts by Topic Modelling tool. The lemma *kobieta* ("*woman*") appears in contexts that refer to discrimination (*No kobieta powinna w domu siedzieć i zajmować się dziećmi*, "Well, a woman should stay at home and take care of the children"; Figure 15), which, being used ironically, signals defensive measures against culture-related stereotypical roles assigned to women deemed child-rearing agents and their pejorative evaluation of gender-oriented differences related to intelligence (compared to intelligent males). These observations corroborate, to some extent, the data achieved through ALDF.

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[12] This ratio was calculated on the basis of Polish immigration to Norway corpus; the study is described in Bączkowska and Šarić (2020).
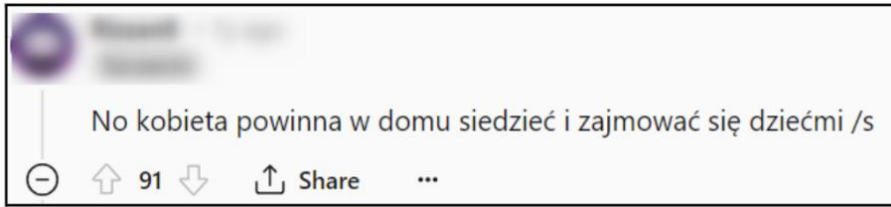
Figure 15
Reddit comment illustrating discriminatory discourse

The word *mężczyzna* ("man") has a comparable frequency to *kobieta* ("woman") and *problem* ("problem") yet a lower ALDF value. It has unequal occurrence across the corpus, and the topic evolves within a smaller number of users. The discussion highlights virile facets of men seen as natural hunters interested in procreation. Moreover, *dziecko* and *problem* are mainly used in contexts associated with *kobieta* and *mężczyzna*. Despite the small size of the corpus at hand, the ALDF values thus allow identifying topics that are not only frequent (in terms of relevant rather than absolute values) but also referred to by a smaller group of users (e.g. minority) yet which can potentially spark further discussion, i.e., evolve to "third space".

In the adjective wordlist, one of the highest ALDF scores is taken by *wielki* ("great"/"very big"). A careful analysis of concordances shows that in 75% of occurrences, it is deployed to encode purposeful exaggeration to express irony (conflated irony and overstatement). 15 verb lemmas used in the comments are connected with mental processes or cognitive functions: *wiedzieć* (2.2 per mln), *rozumieć* (2 per mln). This can point to the effort to give the utterances personalised character, show the reference to good sense or reason, as well as knowledge of both the writers and the readers. Overall, common verbs are primarily deployed, and they are somewhat imprecise in expression.

5. Conclusion

The theoretical framework of irony typology was represented in the data gleaned from Reddit in varying degrees, and the following facets of ironic comments have been observed (related to RQ1). Firstly, there is a predominance of lexical irony, while scalar irony is relatively rare. Secondly, the majority of contexts (80%) ending with a question mark encode SAT-based irony (RQ1, RQ5). Thirdly, there is a small number of stand-alone comments; most comments demonstrate interaction among the Redditors.

As for the general sentiment of the ironic comments in IRC explored manually (RQ2), it has been observed that the most frequent function (70%) is (malicious) jocularity and malice (26%), which leaves less than 4% for the praising/complimenting function. Furthermore, the figure of irony is usually employed to criticise the third party (almost 50%), yet the addressee is only sometimes a ratified participant in Reddit threads. Computer-generated sentiment analysis is generally negative, and the words used in the corpus mirror hate speech discourse, although a jocular overtone most often mitigates their original aggressiveness and negativity (RQ2, RQ5). The predominant topics revolve around social and political issues (RQ2, RQ5), with some marginal topics related to Ukraine, as well as men and women, coupled with the underlying virile overtones or the problem of discrimination of women (RQ4, RQ5).

Another research question (RQ3) revolved around the strategies of coping with ironic comments by their targets. The study has shown that the majority of comments focused on criticising institutions, organisations and generally the so-called third party (47%) as well as non-institutionalised entities, i.e., things and events (37%). Only 13% of comments were directed at an individual, the sender of an ironic comment, and self-criticism was rare (3%). From this, it transpires that the "/s" subreddit primarily expresses opinions on general events and the

economic, social and political situation in Poland rather than as a space where spiteful attacks on individuals are channelled.

Taken together, all the observations above elaborate one of the two aims of the study, which was meant to provide the typology and characteristics of ironic comments seen as vehicles for expressing opinions on the Polish Reddit based on IRC. Thus, opinions on the Polish Reddit tagged as "/s" are primarily conveyed by lexical irony, directed towards non-individual references (institution, events, things), rarely attacking individuals, and frequently couched in rhetorical questions functioning as covert assertions. They foster jocularity (even though through words signalling negative sentiment) and arise from exchanges built in an interaction organically evolving in a thread. Some opinions are expressed on the margin of the central thread theme, and these concern the war in Ukraine and the discriminatory status of women in society.

The other objective of this study was to showcase the use of computer tools in a linguistic analysis; in other words, to propose computational methods applicable to discourse studies (RQ5). Several methods have been deployed in this study. Some of them are already widely used, at least in corpus linguistics, and these comprise distribution, ratios, concordances and relative frequency formulae in tandem with their visualisation, e.g., in the form of word clouds or distribution graphs. Others are more recent solutions offered by computer scientists that rely on AI algorithms or have been used only recently in linguistics, such as machine learning sentiment analysis, topic modelling, or algorithms calculating text saturation with hateful language. Even though the latter are highly advanced text analysis methods, they are offered through the Polish Clarin platform in an accessible way, which does not require technical knowledge or coding skills. This investigation evinces which (and how) computer-based tools can be applied to the textual analysis of opinionated texts based on ironic comments on social media.

On a more general note, as the pilot study presented in this paper demonstrates, a linguistic category deployed to convey

opinions, such as irony, can be analysed quantitatively using computer tools, methods and algorithms. This inscribes into the recent trend promoted by digital humanities which gradually encroaches on the ground of linguistic empirical research. The data examined here predominantly substantiate implicit communication of opinions, given that irony constitutes a form of covert language (Bączkowska 2023), and therefore, this study could be extended onto other types of implicit language, particularly those cases where irony coalesces with some tropes, notably metaphors, understatements or rhetorical questions (Bączkowska 2022a). This preliminary investigation can thus serve as an inspiration and a starting point for subsequent, fully-blown and more fine-grained research endeavours focusing on the preferences of ironic statements manifest on Reddit in Polish or other linguistic contexts prevalent on social media platforms across geographical locations.

Acknowledgement

References

Alba-Juez, Laura, Salvatore Attardo (2014). "The evaluative palette of verbal irony". In: Geoff Thompson, Laura Alba-Juez (eds.). *Evaluation in Context*. Amsterdam – Philadelphia: John Benjamins Publishing Company, 93–116.

Alvarez-Pereyre, Michael (2011). "Using film as linguistic specimen: theoretical and prac tical issues". In Roberta Piazza, Monika Bednarek, Fabio Rossi (eds.). *Telecinematic Discourse*. Amsterdam: John Benjamins, 47–67.

Androutsopoulos, Jannis (2018). "Online data collection". In: Christine Mallinson, Becky Childs, Gerard Van Herk (eds.). *Data*

Collection in Sociolinguistics: Methods and Applications. New York: Routledge, 233–244.

Attardo, Salvatore (2013). "Intentionality and irony". In: Leonor Ruiz Gurillo, Maria Belén Alvarado Ortega (eds.). *Irony and Humor: From Pragmatics to Discourse.* Amsterdam, Philadelphia: John Benjamins Publishing Company, 39–57.

Bączkowska, Anna (2022a). "Explicit and implicit offensiveness in dialogical film discourse in *Bridgit Jones* films". *International Review of Pragmatics* 14/2: 198–225.

Bączkowska, Anna (2022b). ""Hope you have a shit birthday you fat cunt" – cognitive strategies, rhetorical figures and linguistic means used in insulting Tweets". *Forum Filologiczne Ateneum* 1/10: 9–25.

Bączkowska, Anna (2023). "Implicit offensiveness from linguistic and computational perspectives: A study of irony and sarcasm". *Lodz Papers in Pragmatics* 19/2: 353-383.

Bączkowska, Anna, Ljiljana Šarić (2020). "Identity, impoliteness and integration in online immigration discourse". *Forum Filologiczne Ateneum* 1 (8): 75-100.

Cutler, Anne (1974). "On saying what you mean without meaning what you say". In: Michael W. La Galy, Robert Allen Fox, Anthony Bruck (eds.). *Papers from the Tenth Regional Meeting, Chicago Linguistic Society.* Vol. 10. Chicago, Ill.: CLS, 117–127.

Fowler, Henry W. (1965). *Fowler's Dictionary of Modern English Usage.* 2nd ed. New York – Oxford: Oxford University Press.

Frege, Gottlob (1960 [1892]). "On sense and reference" In: P. Geach, M. Black (eds.) *Translations from the Philosophical Writings of Gottlob Frege.* Oxford: Blackwell, pp. 56–78.

Garmendia, Joana (2010). "Irony is critical". *Pragmatics & Cognition* 18/2: 397–421.

Gibbs, Raymond W. (2000). "Irony in talk among friends". *Metaphor and Symbol* 15/1–2: 5–27.

Gibbs, Raymond W., Jennifer L. O'Brien (1991). "Psychological aspects of irony understanding". *Journal of Pragmatics* 16/6: 523–530.

Giora, Rachel (1995). "On irony and negation". *Discourse Processes* 19/2: 239–264.

Grice, Herbert Paul (1989). *Studies in the Way of Words.* Cambridge, MA: Harvard University Press.

Herring, Susan (1996). *Computer-Mediated Communication: Linguistic, Social and Cross-Cultural Perspectives*. Amsterdam – Philadelphia: John Benjamins, 81–108.

Herring, Susan, Dieter Stein, Tuija Virtanen (2013). "Introduction to the pragmatics of computer-mediated communication". In: Susan C. Herring, Dieter Stein, and Tuija Virtanen (eds.). *Pragmatics of Computer-Mediated Communication*. Berlin: De Gruyter, 3–33.

Holdcroft, David (1983). "Irony as a trope, and irony as discourse". *Poetics Today* 4/3: 493–511.

Hurford, James, Brendan Heasley (1983). *Semantics: A Coursebook*. Cambridge: Cambridge University Press.

Ikas, Karin, Gerhard Wagner (eds.) (2009). *Communicating in the Third Space*. New York: Routledge.

Kapogianni, Eleni (2013). *Irony and the Literal Versus Non-literal Distinction: A Typological Approach With Focus on Ironic Implicature Strength*. PhD thesis. Cambridge: University of Cambridge.

Kapogianni, Eleni (2014). "Differences in use and function of verbal irony between real and fictional discourse: (mis)interpretation and irony blindness". *Humor* 27/4: 597-618.

Kerbrat-Orecchioni, Catherine (1986). "Ironia jako trop". Trans. Maria Dramińska-Joczowa. *Pamiętnik Literacki* 77/1: 289–314.

Klamer, Marian, Francesca Moro (2020). "What is 'natural' speech? Comparing free narratives and frog stories in Indonesia". *Language Documentation & Conservation* 14: 238–313.

Kumon-Nakamura, Sachi, Sam Glucksberg, Mary Brown (1995). "How about another piece of pie: The allusional pretense theory of discourse irony". *Journal of Experimental Psychology: General* 124/1: 3–21.

Langacker, Ronald (1987). *Foundations of Cognitive Grammar*. Stanford: Stanford University Press.

Lee, Christopher S., Albert N. Katz (1998). "The differential role of ridicule in sarcasm and irony". *Metaphor and Symbol* 13/1: 1–15.

Lombart, Erika (2022). *L'implicite sur les réseaux sociaux: Entre les lignes des forums de discussion*. Paris: L'Harmattan.

Matwick, Keri, Kelsi Matwick (2017). "Self-deprecatory humor on TV cooking shows". *Language & Communication* 56: 33-41.

Muecke, D. C. (1973). "The communication of verbal irony". *Journal of Literary Semantics* 2/Jahresband 1973: 35–42.

Partington, Alan (2006). *The Linguistics of Laughter: A Corpus-Assisted Study of Laughter-Talk*. London – New York: Routledge.

Partington, Alan (2007). "Irony and the reversal of evaluation". *Journal of Pragmatics* 39: 1547–1569.

Savický, Petr, Jaroslava Hlaváčová (2002). "Measures of word commonness". *Journal of Quantitative Linguistics* 9/3: 215–231.

Searle, John R. (1975). "Indirect speech acts". In: Peter Cole, Jerry L. Morgan (eds.). *Syntax and Semantics* 3: *Speech Acts*. New York: Academic Press, 59–82.

Seto, Ken-Ichi (1998). "On non-echoic irony". In: Robyn Carston, Seiji Uchida (eds.). *Relevance Theory: Applications and Implications*. Amsterdam: John Benjamins, 239-256.

Sperber, Dan, Deirdre Wilson (1986). *Relevance: Communication and Cognition*. Cambridge, Mass.: Harvard University Press.

Strauss, Anselm L., Juliet Corbin (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. London – New Delhi: SAGE Publications.

Vochocová, Lenka, Jana Rosenfeldová (2019). "Ridiculed, but safe: What e-mothers' discussion on migration tells us about the potential of 'third spaces' for the political communication of women". *European Journal of Communication* 34/2: 142-158.

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