Psychology of Language and Communication 2022, Vol. 26, No. 1

sciendo

DOI: 10.2478/plc-2022-0004

Raissa Ellis
Institute of English Studies, University of Warsaw, Poland

Testing the impact of paraverbal irony signals. Experimental study on verbal irony identification in face-to-face and computer-mediated communication

This paper reports the results of an experimental study with a between subject design ($N = 122$) whose aim was to compare irony comprehension rates in face-to-face (FTF) and computer-mediated communication (CMC), and examine the influence of paraverbal irony signals on irony identification rates. An irony comprehension test was intersemiotically translated to three conditions: FTF ($n = 46$), paraverbal signal-rich CMC ($n = 30$), and paraverbal signal-poor CMC ($n = 46$). The study adopted a relevance theoretic account of irony. There was a statistically significant difference between the signal-rich CMC and FTF conditions - irony identification rates were higher in the signal-rich CMC condition. The results are important since they suggest that paraverbal irony signals are not essential for correct irony identification if relevant contextual information is available, and the CMC medium is not only unlikely to be an obstacle in communicating the ironic intent, but with the addition of the medium-specific irony signals, may be significantly better.

Key words: irony, computer-mediated communication, paralanguage, relevance theory

Address for correspondence: Raissa Ellis, Institute of English Studies, University of Warsaw, Hoża 69, 00-681, Warsaw, Poland.

E-mail: r.ellis@uw.edu.pl

This is an open access article licensed under the CC BY NC ND 4.0 License.

Irony is an interesting yet puzzling communicative phenomenon. As an extreme form of indirect speech (the intended meaning of the utterance may even be the opposite of the literal meaning), irony is thought to come with a high risk of miscommunication. Various cues, sometimes labeled irony markers (Attardo et al., 2003) or signals (Hancock, 2004), help identify the ironic intent of the speaker. So, irony identification is assumed to be positively correlated with the presence of paraverbal irony signals, typically present in face-to-face (FTF) communication (Hancock, 2004; Hancock et al., 2000). The contribution of paraverbal irony signals such as tone of voice or facial expression to the correct interpretation may be significant, or their role may be merely auxiliary (Ellis, 2019). According to the relevance theoretic account of irony (Sperber & Wilson, 1981; Wilson, 2006, 2017; Wilson & Sperber, 1992), all crucial interpretive elements necessary for the correct comprehension of irony are established inferentially: The content of the echoed assumption, its attribution to a source, and the type of attitude expressed by the speaker to the metarepresented content and the implicatures. Paralinguistic irony signals are the only elements not communicated tacitly (Piskorska, 2014).

In FTF interactions, an intonation invariably accompanies the spoken component, and the speaker always presents some facial expression. Since in FTF, the removal of such paraverbal irony signals is practically unattainable, it is difficult to assess their contribution to a successful interpretation. However, in computer-mediated communication (CMC), such separation is easy to obtain. Currently, CMC has replaced many FTF interactions and although many irony signals commonly present in FTF exchanges are unavailable in written CMC, there are some CMC-specific signals, such as typical or atypical punctuation, capitalization, emoticons, emoji, and hashtags, that accompany messages in CMC and may successfully cue the hearer/receiver to the ironic intent of the speaker/sender, thus, in a way, replacing the paralanguage available in FTF interactions.

Jakobson (1959/2000) offered a division of translation into intralingual, interlingual, and intersemiotic, the latter being of interest here. Intersemiotic translation or transmutation is a term applied to translations from one system of signs to another. As examples, Jakobson offered transpositions from verbal art into cinema, dance, or music. The notion of intersemiotic translation has been readily embraced across the humanities (Kaźmierczak, 2017). It appears that transformation of messages from FTF to CMC falls within the scope of intersemiotic translation. Kaźmierczak (2017) aimed to clarify the notion of transmutation, as the use of the term in the context of translation is inconsistent. It seems that according to her understanding, the process involved in adapting examples of FTF irony into CMC should be treated as as intersemiotic translation: FTF and CMC differ in semiotic structure, there is a direct correspondence across the contexts as the same ironic messages occur in FTF and CMC, and one context serves as the basis for the other. Kaźmierczak (2017) did not address CMC in her elucidations, but she pointed out that film adaptations are treated as intersemiotic translations (e.g., Cattrysse, 1992; Del Grosso, 2008; Hopfinger, 1974; qtd. in Kaźmierczak, 2017). She also

classified the graphic novel *Heart of Darkness* by Catherine Anyango and David Zane Mairowitz as a transmutation of the work of Joseph Conrad. Therefore, the use of the term "intersemiotic translation" seems to adequately capture the correspondence between FTF communication and CMC in the current study.

Furthermore, it may be tentatively proposed that CMC users themselves occasionally engage in intersemiotic translation from FTF to CMC, especially when FTF interaction is prototypical for the message type. For instance, imagine a situation in which a niece cannot come to her favorite aunt's birthday luncheon but still hopes to convey her best wishes. In FTF interaction, she would have not only verbally expressed herself, but also hugged her aunt and given her flowers. In CMC, she may type the same verbal message she would have opted for in FTF communication and, additionally, she may send her aunt an emoji of a hug, or add more text stating that she sends her lots of hugs, or an emoji or a photo of a bouquet. The reason for adding the CMC-specific expression of hugs and flowers is directly caused by the FTF interaction representing the prototypical mode of the message, which gets intersemiotically translated from FTF to CMC. In this example, the flowers serve as a visual explicature[1] (Yus 2019, 2021) denoting the conceptual referent and as a symbol to communicate love and care (visual implicature). In the experimental items in the current study, the photographs and emoticons served as visual explicatures that complemented the verbal component of the messages just as their physical manifestations do in FTF.

There are very few studies systematically comparing verbal irony in FTF and CMC. Two such studies focused on irony production (Aguert et al., 2016; Hancock, 2004). To the best of the author's knowledge, there are no studies directly examining whether the verbal irony produced in CMC is comprehended equally successfully as irony produced in FTF interactions. Hancock's (2004) study provided evidence of abundant irony production in CMC, but that of comprehension was lacking, and the study by Aguert et al. (2016) focused solely on production. The present study aimed to compare irony identification rates of the same, intersemiotically translated instances of irony in CMC and FTF communication. Since in CMC, it is easy to isolate paraverbal clues from the verbal input, the CMC version of the same stimulus was prepared in two versions: paraverbal signal-rich and paraverbal signal-poor conditions.

The goal of the current experimental study was to directly compare irony identification rates in CMC and FTF communication and examine the influence of paraverbal irony signals on irony identification rates through the isolation of those signals in CMC. Since a CMC-specific paralanguage is available and because CMC has been shown to be a suitable environment for irony to occur (Aguert et al., 2016; Hancock, 2004; Whalen et al., 2009; Whalen et al., 2013), it was hypothesized that irony will be identified equally successfully across the

1 According to Yus (2019, 2021), comprehension of multimodal and visual discourse yields visual explicatures and visual implicatures. In traditional visual studies, these two terms would be related to the denotative and connotative distinction respectively.

three conditions. Paraverbal irony signal-rich CMC was predicted to yield higher rates of correct irony identification than signal-poor CMC. The rationale for comparing the two CMC conditions is that in CMC, the paraverbal irony signals may be entirely removed, unlike in FTF communication. Paraverbal irony signals have been the focus of empirical studies on irony in FTF communication (e.g., Attardo et al., 2003; Bryant & Fox Tree, 2005). In FTF communication, it is difficult, if not impossible, to test the impact of paraverbal irony signals on irony comprehension. On the other hand, in CMC, it is possible and simple. In FTF interactions, the paraverbal irony signals such as facial expressions, the tone of voice, the pace of speaking, pitch, volume, and so forth are inseparable from the verbal component of the ironic message. Some facial expression and prosody always accompany the verbal element. However, in CMC, such separation between the verbal component and the paraverbal signals is easy to obtain and typical of the medium. In CMC, it is perfectly acceptable when no special punctuation or emoticons accompany the verbal component even in messages with ironic intent. The comparison of CMC that is rich and poor in paraverbal irony signals offers a unique opportunity to test the impact of paraverbal irony signals on comprehension of ironically intended messages.

Research Design Challenges

In experimental studies on verbal irony, adopting operational definitions of the phenomenon is crucial, but complicated. There are numerous established theoretical accounts of verbal irony, but no apparent scientific consensus. The experimenter who intends to use authentic discourse samples needs to find an account of verbal irony on which to base operational definitions in a given study. The selected account must be useful at a number of stages: during stimulus selection, prompt and question design, and interpretation of participants' responses. Moreover, in a study on verbal irony in CMC, the theoretical account must be able to address the specificity of the medium.

Expert critiques of quantitative studies on verbal irony appear to generally focus on problems with the classification of discourse samples as verbal irony and the problems concerning the form of the study materials. Burgers et al. (2011) pointed out the problematic operationalizations in corpus-analytic studies: for instance, in the Eisterhold et al. (2006) study, the researchers relied on the so-called standard definition of irony where the ironist intends to convey the opposite of what they appear to be saying and a folk linguistic understanding of the phenomenon. After corpus compilation, the study utilized an outside rater without any instruction as to what conditions the samples must meet to be qualified as irony. Burgers et al. (2011) criticized this approach, among others, for its lack of precision and clarity in differentiating irony from nonirony. Wilson (2017) would most likely discount the choice of the standard definition of irony for its inability to explain many ironic instances. Wilson described quite an

opposite problem concerning irony operationalization in experimental studies: since the perception of irony as communicating the opposite of what one is saying is no longer considered as dominant or even correct, researchers started to commonly treat a range of unrelated phenomena as verbal irony. She pointed out the problematic nature of classifying discourse samples that do not exhibit any of the distinctive features of irony as ironic.

Partington (2007) saw artificiality in the choice of irony examples discussed in literature as a problem, as well as the repetition of the same instances of irony in various papers. He was also critical of experimental studies for exposing participants to situations and stimuli that are too simple and inauthentic. Dynel (2017) likewise criticized the fact that examples of irony in both theoretically oriented literature, as well as in experimental research are repeated in numerous papers and unquestionably taken to be correct samples of verbal irony. She was also critical of the samples of irony being unrelated. Katz (2009) indicated that the widespread use of texts generated by experimenters was a problem in very many studies of irony, including his own. His critique focused on the artificiality of situations and the way of speaking presented in the materials.

To avoid the pitfalls pointed out by irony scholars, it is advisable to choose operational definitions based on an established and cognitively plausible theoretical account which is also characterized by good explanatory power. The selected account should propose a mechanism underlying the phenomenon, which could serve as a tool to decide both whether irony is present in a given stimulus and recognized by the study participant. Additionally, there are quite a few differences between verbal irony occurring in FTF conversations and in text-based CMC. Therefore, the selected theoretical approach should be compatible with the specificity of the medium.

According to relevance theory (Sperber & Wilson, 1995), in CMC as well as in FTF communication, what guides inferential comprehension is the expectation of relevance raised by an utterance against the context. The ostensive-inferential communication model is commonly and successfully applied to explain CMC (e.g., Yus's, 2011, 2021, comprehensive analyses of CMC from the perspective of relevance theory-based cognitive pragmatics). The relevance theoretic echoic account of irony provides a cognitively plausible explanation of the reason for irony to occur by specifying the underlying mechanism of echo. Thus, the aim of verbal irony is to express a dissociative attitude to a metarepresentation of a tacitly attributed thought. The echoic account of irony was first experimentally tested by Jorgensen et al. (1984) in a paradigm-shifting study where the authors illustrated one way in which "irony is amenable to experimental treatment" (p. 112). Relevance theory as a general theory of communication is well suited to CMC, as is its integrated account of irony for experimental research relating to the phenomenon. This was also the framework of choice in the current study.

Paraverbal Irony Signals in Face-to-Face Communication

Attardo et al. (2003) examined multimodal markers of irony, including prosodic features, and found that "there exists no 'ironical intonation' per se, but rather that pitch is a contrastive marker for irony or sarcasm" (p. 243). The body language markers included facial expressions identified in previous literature, such as the movement of eyebrows, smiling, nodding, winking, and a number of eye movements, as well as the new visual marker identified in the study – the "blank face." The authors concluded that they have not identified any particular signals that hint at the ironic intent, but that the co-occurring signals contrast with what is stated. Bryant and Fox Tree (2005) noticed that in many verbal irony comprehension studies, researchers often rely on the notion of sarcastic intonation or an ironic tone of voice, which is assumed to be "some particular consistent prosodic (i.e., pitch, loudness, and duration) pattern with a distinct perceptual correlate that is systematically associated with verbal irony." (p. 257). However, they concluded that there was no particular ironic tone of voice: there was no set of vocal signals that listeners use to differentiate ironic versions from nonironic ones, aside from a higher amplitude variability in the number of the most prototypical examples of irony when compared to the nonironic counterparts

In conclusion, previous studies found no specific paralinguistic features consistently co-occurring with verbal irony. The tone of voice and facial expressions functioned as paraverbal irony signals when used contrastively with the content of the utterances, which could be explained by the relevance theoretic account of irony in the following way: body language and tone of voice incongruent with the literal meaning of ironically intended utterances help the addressee identify that the speaker's intention is not to use the utterance, but to mention it in order to express a negative attitude to it.

Irony in Computer-Mediated Communication

Some researchers (e.g., Hancock, 2004; Sproull & Kiesler, 1986) hypothesized, and Internet style guides (Crystal, 2006) warned, that CMC is a worse medium for conveying ironic meaning, with a relatively high risk of miscommunication. However, results of empirical studies appear to show the opposite. In fact, there is increasingly more evidence which confirms that CMC is a suitable environment for irony production. It occurs in instant messaging (Hancock 2004), e-mails (Whalen et al., 2009), blogs (Whalen et al., 2013), and Internet fora (Aguert et al., 2016).

Among the features of speech listed by Crystal (2006) as absent in CMC, prosody and body language appear to be the most relevant to the communication of irony. Stress and body language may be creatively conveyed by senders in CMC when their inclusion is necessary. Crystal suggests that in CMC, users aim to replace the paralanguage naturally occurring in speech with the exaggerated use of punctuation and spelling, as well as capitalization and repetition of letters

and punctuation marks. Even though emoticons and emoji differ in many respects from paralinguistic FTF communication, they are considered the paralanguage of the Internet (Dery, 1993). Empirical studies on emoticons and emoji suggest that they fulfil similar functions to nonverbal behaviour in FTF interactions (Ganster et al., 2012). Hashtags found on social networking sites have evolved from serving the search function to convey contextual information and contribute to comprehension of both explicit and implicit meaning (Scott, 2015), much like paralanguage in FTF communication. As was suggested above, paraverbal irony signals in FTF communication rely on an incongruence between the paralanguage and the literal meaning of the ironically intended utterance. Such incongruent use of paralanguage seems to be replicable in the CMC medium.

Methods

A multimodal verbal irony comprehension test was designed, based primarily on authentic discourse samples collected from the student population. The 11-item test consisted of nine episodes featuring an introduction of context, including a short dialogue between the ironist and interlocutor, and culminating in an ironic remark. Two nonirony episodes were also included: one literal statement and one nonironic instance of indirect communication. The participants consisted of a homogenous group of individuals (see the Participants section). Because of this homogeneity of the group, the experimental items were specifically designed with these participants in mind. The stimuli featured elements of the Warsaw landscape and activities in which students commonly engage, such as going to a café and evaluating the experience. Many were based on authentic instances of irony gathered from the student population. The intention was to ensure that the ease of processing of each example would be similar for the participants, which was also advantageous, because the study employed a between-subjects design. Additionally, the echoic account of irony was consistently utilized in the study. The instances of verbal irony in the stimuli met the criteria of the operationalization based on the echoic account of irony. According to relevance theory (Sperber & Wilson, 1995), the aim of verbal irony is to express a dissociative attitude to a tacitly attributed thought. Thus, the episodes met the following criteria: (a) the proposition expressed by the utterance represented a belief attributed to someone else than the speaker at the time of speaking/sending a message, (b) the ironist conveyed a tacitly expressed dissociative attitude towards the aforementioned belief. The number of experimental items was determined after taking into consideration the following factors: the limits of optimal attention of the participants as well as the time they volunteered to allot, which was 10-15 minutes; the desire to include a variety of instances of irony so that the items would reflect the range of naturally occurring instances of irony. The variety was thought to also be beneficial to the experimental design, as a lesser number of control items was necessary when the irony containing items differed.

The test was intersemiotically translated into FTF and CMC conditions. The latter was subdivided into paraverbal irony signal-rich and signal-poor conditions to assess the contribution of the paraverbal cues to successful irony identification. Consequently, three groups of participants were tested. The FTF group was shown film clips, and the CMC groups were shown screenshots of the exchanges as they would appear on a screen of a typical device. The prerecorded clips in the FTF condition emulated natural FTF interactions as much as possible. The recordings ensured that each participant was presented with the exact same facial expression, intonation, pace, and volume of the speaker's voice as well the as surroundings such as the weather, and so forth. The script for each scene aimed to emulate authentic FTF communication of irony by ensuring, among others, the availability of contextual information (including a dialogue between the speaker and interlocutor preceding the final ironic comment) and condition-specific paraverbal irony signals.

Participants

One hundred and twenty-two native speakers of Polish, male and female full-time undergraduate and graduate students at the University of Warsaw, Poland, participated in the experiment[2]. The language of the entire experiment was Polish, and nonnative speakers were excluded. The participants were assigned to one of three conditions: FTF communication ($n = 46$), paraverbal signal-rich CMC ($n = 30$), and paraverbal signal-poor CMC ($n = 46$). The participants took part in the study voluntarily and provided informed consent.

Materials

Pilot Study

Prior to the formulation of the multimodal test, a written vignette-based pilot study was conducted to evaluate some features of the test's form, the instruction prompt, and the question design, as well as the willingness of the potential participants to take part in and respond to ironic stimuli presented in such a way. Twenty male and female students at the University of Warsaw, Poland, took part in the pilot study. The participants were presented three vignettes: two contained ironic utterances (one presenting a familiar cultural concept and the other presenting an unfamiliar one), and one was a filler item. They were asked two follow up questions: the first related to the body of the text to ensure that the participants read the prompt (Jorgensen et al., 1984). The second was to elicit information on irony identification by asking about the reason a particular phrase was used. Responses to the second question confirmed that this is an adequate method of gathering

2 As is standard practice in this type of research, the participants were opportunistically selected, and so, the sample is not representative of the entire population (Ziółkowski 2015). Consequently, conclusions based on the study are most likely to correctly reflect the tendencies of young, educated native speakers of Polish, and not necessarily all native speakers.

evidence that irony was identified. Results pointed to a lower rate of successful irony identification when the prompt was based on a concept that was not entirely familiar to the audience. Therefore, it was established that the examples used in the main study should be culturally relevant to the participants. There was no comparable problem with the second irony vignette where a familiar concept was used. Conclusion was reached to avoid using culturally irrelevant concepts the participants might be unfamiliar with.

Main Study

The language of the entire study was Polish. In order to connect the episodes and construct a cohesive test, all of the episodes featured the same speaker/sender known as Ola. She was intended to look, act, and sound like a fellow graduate student, as perceived by the participants. In the materials, Ola was introduced as the participants' acquaintance whom they may know from one of the university lectures they attended together.

Nine stimuli featured episodes with an ironic final comment made by Ola. A clear view of Ola's face was visible in the videos, with the aim of providing the participants with the ability to derive cognitive communicative benefits from the irony signals present in her facial expression. Each of the scenes started with the context of the ironic remark in response to which it was made or to which it alluded. The ironic line was Ola's last comment in each scene. This sequential pattern was reflected in the CMC equivalents. In CMC All of the images relating to an individual episode were presented to the participants at the same time.

In the FTF condition, video clips of each experimental item were recorded to present the context of the ironic remark as well as the facial expression and tone of voice of the speaker. Care was taken to ensure the speaker acted as natural as if she were having a casual conversation. Examples in the signal-rich CMC condition consisted of screenshots of communicative exchanges equivalent or closely resembling the content of the FTF episodes. The screenshots were produced to look like authentic cases of CMC with characteristic visual features of a given output. The CMC varieties included: an IMessage exchange, an Instagram post, and a Facebook interaction. The sender's messages in this condition contained a range of paraverbal signals such as emoticons, emoji, punctuation, and hashtags, while aiming to appear natural. The signal-poor CMC condition was identical, with the exception of paraverbal signals, which were removed or minimized, aiming to be characteristic of an interlocutor who does not typically use such signals in CMC. In each condition, the stimuli were preceded by an instructive introduction with the same content across conditions, but retaining the form of a given condition.

Test Item Example. This section includes one of the test items in the three conditions tested. The illustrations feature paralanguage, or lack of it, in the final ironically intended comment.

The FTF condition: First scene: Ola is having a phone conversation.
Ola: That's wonderful…
Interlocutor: And where are you guys going?
Ola: To the beach.
Interlocutor: Wow! Where?
Ola: Międzyzdroje. Oh, summer by the sea… I can hardly wait!
The next scene features Ola at her destination (see Figure 1), where it is cloudy, windy, the beach is empty, and she seems cold.
Ola: Oh, summer by the sea…

The CMC conditions: IMessage exchanges.
Interlocutor: Where?
Ola: Międzyzdroje Interlocutor: Wow!
Ola: Oh..summer by the sea...I can hardly wait + emoji (sun, ice-cream, beach)

Second screenshot:
Interlocutor: Hello :) how's Międzyzdroje?
Paraverbal signal rich (see Figure 2). Ola: Oh (snowflake emoji) summer by the sea (broken heart emoji)
Paraverbal signal poor (see Figure 3). Ola: Oh, summer by the sea.

Figure 1. *Paralanguage in the Face-to-Face Condition*



Figure 2. *Computer-Mediated Communication Message Rich in Paraverbal Signals*



Figure 3. *Computer-Mediated Communication Message Poor in Paraverbal Signals*



In this item, the following implicated premises are inferable in all conditions: Ola was looking forward to the experience of having a pleasant time by the sea in the warmest time of year in Poland: summer. The sky is cloudy, it is windy, the beach is empty. The implicated conclusion is that Ola is disappointed. There is a possibility of misunderstanding, in all conditions, that the seashore is attractive to her, irrespective of the weather. The ironic utterance in the FTF condition was accompanied by body language suggesting that it is cold and a facial expression of lack of enthusiasm as well as a flat intonation pattern, which contrasts with the happy facial expression and enthusiastic intonation expressed by Ola in her earlier phone conversation while using the same words in the same order. Similarly, in the signal-rich CMC condition, Ola's initial laudatory "Oh... summer by the sea" is followed by emoji of "sun," "ice-cream," and "beach with umbrella," while her later rendition of the same words is accompanied by the "snowflake" and "broken heart" emoji. In the signal-poor CMC condition, Ola's ironic utterance is not accompanied by any emoji or other paraverbal signals added.

Procedure

The participants were given the paper forms on which to write down their answers, were instructed to pay attention to the screen where they would watch the film clips (FTF) or read the instances of communication (CMC). After each item, they were asked to write, in short, what their understanding of the message was. After each item, the participants were given time to provide their answers, but not to dwell on it. To elicit irony comprehension, but not to reveal what was being tested[3], the participants were asked the following question: "*Write in short what, in your opinion, Ola means by using these particular words. What does she want to communicate by her final comment?*"

3 Demand characteristics negatively affect the quality of research when the subjects' responses are skewed to reflect what the subjects believe the experimenter wants them to provide and not their untainted opinions alone (Ziółkowski, 2015).

Questions of similar form were employed by Jorgensen et. al. (1984) to obtain evidence of irony identification, and the pilot study confirmed that this form is valid for such elicitation from the population of participants.

In the FTF condition, the participants were informed that the clips are short, and it is important to pay attention to the screen from the beginning of the scene. In order to help the participants direct their attention to the screen from the very start of each scene, a gentle sound was played two seconds before each scene began. After viewing the clip, participants had forty seconds to write their interpretation. The clip was played only once because it was designed as a laboratory reproduction of a natural phenomenon.

In the CMC conditions, the participants were informed that the sound indicates a change of items. Each item was displayed for fifty seconds, during which the participants were to read the presented exchange and write down their answers. They had the opportunity to reread the text, which is a natural feature of CMC.

To minimize misinterpretation of responses and ensure clarity during evaluation, all the collected replies were transcribed from the participants' handwritten input. Features such as idiosyncratic spelling or punctuation were retained because they were thought to be possibly helpful during the evaluation process. The responses were classified into successes and failures at identification of irony in the episodes. A participant was evaluated to have identified irony if they provided the approximate intended implicature content, when the content of the response suggested the participant perceived the remark as ironic, and/or when lexical items such as "ironic," "sarcastically," and so forth were used. Responses were judged as failures when a literal interpretation was suggested, when an alternative interpretation was given which was inconsistent with the ironic attitude of the speaker, and/or when it was impossible to judge from the response whether the participant identified irony or not. A competent judge, a linguist familiar with the relevance theoretic account of irony, coded the responses. To increase the validity of the ratings, the judge coded the responses twice, on separate occasions, two months apart. Comparisons between the ratings revealed almost perfect agreement (Cohen's $\kappa = 0.98$). The minor discrepancies were resolved by another relevance theoretician.

The following are some representative responses of the participants to the test item introduced in the previous section, serving as evidence of correct irony identification:

FTF condition: "Her tone [of voice] indicates that these are not the holidays she imagined"

CMC paraverbal signal rich condition: "Ola is dissatisfied with the weather by the sea"

CMC paraverbal signal poor condition: "Excitement turns into a disappointment when Ola goes to the sea and it turns out that the weather is bad"

Sample of responses judged as irony identification failures:

FTF condition: "I'm not sure"

CMC paraverbal signal rich condition: "that it is cold (snowflake), but [heart symbol in a circle] it could have been expected and it is ok"

CMC paraverbal signal poor condition: "Ola shows what a great life she has."

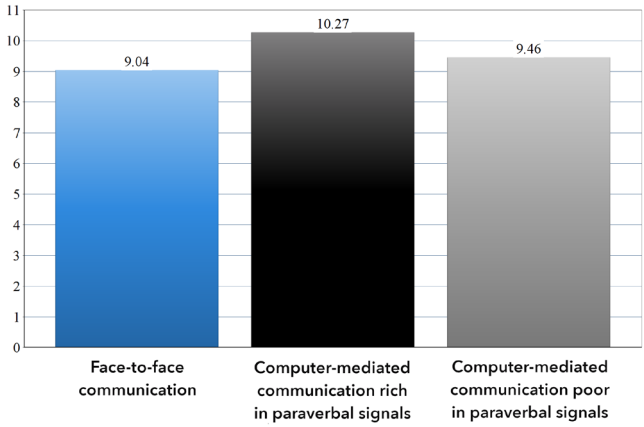
Results

The minimum and maximum scores, as well as the range of scores in each condition are as follows : In FTF ($n = 46$), the minimum score was 56% of correct responses, the maximum was 98%, and the range was 42%. In the signal-rich CMC condition ($n = 30$), the minimum score was 70%, the maximum was 100%, and the range was 30%. In the signal-poor CMC condition ($n = 46$), the minimum score was 67%, the maximum was 98%, and the range was 31%.

There was a statistically significant difference between groups as determined by a one-way analysis of variance (ANOVA), $F(2, 119) = 6.520$. $p = .002$. A Bonferroni-corrected post hoc test indicated that there was a statistically significant difference between the FTF ($M = 9.04$, $SD = 1.55$) and the signal-rich CMC-condition ($M = 10.27$, $SD = 1.14$): irony identification rates were significantly higher in the signal-rich CMC condition. The difference between the FTF and signal-poor CMC condition ($M = 9.46$, $SD = 1.51$) was not statistically significant.

The scores were calculated based on two ratings of a competent judge: a linguist familiar with the relevance theoretic echoic account of irony, who coded the answers as successes at irony identification (with the value of 1) and failures

Figure 4. *Results of the Irony Identification Test*



(with the value of 0) at two different times, over two months apart. Comparisons between the ratings revealed almost perfect agreement (Cohen's $\kappa = 0.98$). The minor inconsistencies were resolved by another linguist.

Discussion

Verbal irony conveyed in CMC was identified as successfully as in FTF communication. In fact, the CMC-specific paralanguage appears to have contributed significantly to the higher success rates in the signal-rich CMC condition when compared to the FTF condition. Despite the communicative contribution of the facial expressions, body language, and tone of voice of the speaker, the irony identification rates in the FTF condition were similar to the signal-poor CMC condition, devoid of the paralinguistic contributions to conveying the ironic comments. The differences between the two CMC conditions were not statistically significant, which means that lack of paralanguage did not influence rates of correct irony identification. Consequently, the results point towards the conclusion that paraverbal signals serve an auxiliary role and are not essential to irony comprehension. According to relevance theory, paralinguistic irony signals are the only elements in verbal irony that are not communicated tacitly. The fact that this study found them not to be essential to irony comprehension is consistent with the relevance-theoretic claim that all elements essential to irony comprehension are established inferentially (Piskorska, 2014).

It could be hypothesized that the reason why CMC-specific paralanguage appears to be significantly more effective than FTF-specific paralanguage is due to its relevance (Sperber & Wilson, 1995). It takes more cognitive effort to process the FTF-specific paralinguistic contribution than a CMC-specific one, while the positive cognitive effects remain the same. It is difficult to equate a smiling emoji with a multitude of various facial expressions which could be classified as smiles, each of them conveying a somewhat different attitude. Beyond that, each individual's face and degree of expressiveness is different. However, in CMC, individuals communicate using the exact same set of emoticons/emoji. This aids their communication by removing yet another layer of disambiguating a hearer might have to perform to derive the same cognitive benefits. Similarly, in FTF communication, where intonation is idiosyncratic, the hearer may need to expend more effort to derive the same positive cognitive effects as from a corresponding CMC-specific irony signal such as the use of capitalization.

When utilized, CMC-specific paralanguage contributes to higher relevance of irony in CMC and may explain why irony is produced more abundantly in CMC when compared to FTF communication (Aguert et. al., 2016; Hancock, 2004). It is not very well understood why there is more irony production in CMC. Perhaps one of the contributing factors may be that CMC users realize that utilizing CMC-specific irony markers significantly decreases the risk of

miscommunication. This observation would be consistent with Kreuz and Link's (2002) sociolinguistic principle of inferability, confirmed in studies of irony in FTF communication. According to the principle of inferability, the speaker will use irony when chances of being understood are high (high inferability) and will not risk miscommunication if the chances appear to be low.

In the multimodal test, it was important to include only those instances of irony that conformed to the relevance theoretic echoic account of irony, but also could realistically have occurred across the conditions. Relevance theoreticians distinguish varying degrees of strength of implicatures that could be conveyed by utterances (Jodłowiec, 2012). The limitation of the study is that the test included only relatively central cases of irony. Perhaps the influence of paraverbal signals would have been more significant on borderline cases of irony, with weaker implicatures that are more difficult to grasp.

The focus of previous comparative studies on irony in CMC and FTF communication was irony production (Aguert et al., 2016; Hancock, 2004). The current study measured comprehension, and in line with the findings of the production studies, determined that the CMC medium facilitates higher comprehension as well. In the comparative study on irony production in CMC and FTF, Aguert et al. (2016) found that over three quarters of ironic utterances were accompanied by irony signals and the difference between FTF and CMC was not significant. The authors note that some signals were medium-specific, and some were the same across conditions. In the current study, the comparison of medium-specific signals revealed a significant advantage of the CMC-specific paralanguage.

Conclusion

The goal of the present study was to directly compare irony identification rates in CMC and FTF communication and examine the significance of the influence paraverbal irony signals have on irony comprehension through the isolation of those signals in CMC.

Future researchers could consider examining if the importance of paraverbal signals increases with less central cases of irony or in CMC contexts where contextual sources are less accessible than in the current study. The dissociative attitude present in the higher level explicature of an ironic utterance may range from weakly dissociative to strongly scornful. The more prominent the dissociative element of the attitude, the more ironic the utterance feels (Piskorska 2014). In humorously intended borderline cases of irony, the speaker may be significantly aided by paralanguage to convey their intention. Epistemic vigilance mechanisms trigger the search for relevance on the ironic interpretation when the discrepancy is noticeable enough to deem the literal reading as unacceptable (Padilla Cruz, 2013, Piskorska, 2014). In cases of irony where contextual sources are not accessible enough to the hearer/receiver the value of paraverbal signals

may be significantly higher because without their contribution, the discrepancy between the available contextual assumptions and the literal meaning of the utterance may not be perceptible enough. Additionally, in future studies on the topic, it would be valuable to take gender distribution into account, since there is a significant body of research considering the activation of the mechanism of linguistic bias in an intergroup context in nonliteral language use (Milanowicz & Bokus, 2020; Milanowicz et al. 2017; Wigboldus & Douglas, 2007)

Verbal irony in CMC was identified as successfully as in FTF communication. Additionally, the success rates were significantly higher in CMC compared to FTF communication when CMC-specific paraverbal signals were present. Therefore, it was concluded that the CMC medium is not only unlikely to be an obstacle in communicating the ironic intent, but, with the addition of the medium-specific irony signals, may be significantly better. Inclusion of CMC-specific irony signals may significantly increase the relevance of utterances. Absence of paraverbal irony signals did not influence rates of correct irony identification. Hence, the results of the study point towards the conclusion that paraverbal signals are not essential to irony comprehension and their role is auxiliary. In line with the findings of comparative CMC versus FTF communication studies whose focus was irony production, it was determined that the CMC medium facilitates higher irony comprehension as well.

Acknowledgments

I wish to acknowledge the help provided by Professor Ewa Mioduszewska-Crawford, Professor Agnieszka Piskorska, Professor Agnieszka Otwinowska-Kasztelanic, Dr Adrian Ziółkowski, Dr Katarzyna Hryniuk, Joanna Kłosowska and Dr Agata Kochańska.

Conflict of Interest Disclosure

The author declares that they have no conflicts of interest.

Funding

The author declares no sources of funding.

Research Ethics Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institution and APA's Ethical Principles of Psychologists and Code of Conduct. Informed consent was obtained from all individual participants involved in the study.

References

Aguert, M., Laval, V., Gauducheau, N., Atifi, H., & Marcoccia, M. (2016). Producing irony in adolescence: A comparison between face-to-face and computer mediated communication. *Psychology of Language and Communication, 20*(3), 199–218. https://doi.org/10.1515/plc-2016-0013

Attardo, S., Eisterhold, J., Hay, J., & Poggi, I. (2003). Multimodal markers of irony and sarcasm. *Humor, 16*(2), 243–260. https://doi.org/10.1515/humr.2003.012

Bryant, G. A., & Fox-Tree, J. E. (2005). Is there an ironic tone of voice? *Language and Speech, 48*(3), 257–77. https://doi.org/10.1177/00238309050480030101

Burgers, C., Van Mulken, M., & Schellens, P. J. (2011). Finding irony: An introduction of the Verbal Irony Procedure (VIP). *Metaphor and Symbol, 26*, 186–205. https://doi.org/10.1080/10926488.2011.583194

Crystal, D. (2006). *Language and the internet.* Cambridge University Press.

Dery, M. (1993). Flame wars. *The South Atlantic Quarterly, 92*(4), 559–568.

Dynel, M. (2017). The irony of irony: Irony based on truthfulness. *Corpus Pragmatics, 1*, 3–36. https://doi.org/10.1007/s41701-016-0003-6.

Eisterhold, J., Attardo, S., & Boxer, D. (2006). Reactions to irony in discourse: Evidence for the least disruption principle. *Journal of Pragmatics 38*(8), 1239–1256. https://doi.org/10.1016/j.pragma.2004.12.003

Ellis, R. (2019). Badanie ironii w komunikacji internetowej – szanse i zagrożenia [Studying verbal irony in Internet communication – opportunities and risks]. In K. Burska, & B. Cieśla (Eds.), *Kreatywność językowa w przekazach internetowych* [Linguistic creativity in Internet messages] (pp. 27–38). Wydawnictwo Uniwersytetu Łódzkiego.

Ganster, T., Eimler, S. & Kramer, N. (2012). Same but different!? The differential influence of smilies and emoticons on person perception. *Cyberpsychology, Behavior, and Social Networking 15*(4), 226–230. https://doi.org/10.1089/cyber.2011.0179

Hancock, J. T. (2004). Verbal irony use in face-to-face and computer-mediated conversations. *Journal of Language and Social Psychology 23*(4), 447–463. https://doi.org/10.1177/0261927X04269587

Hancock, J. T., Dunham, P. J., & Purdy, K. (2000). Children's comprehension of critical and complimentary forms of verbal irony. *Journal of Cognition and Development, 1*, 227–248. https://doi.org/10.1207/S15327647JCD010204

Jakobson, R. (1959/2000). On linguistic aspects of translation. In: L. Venuti (Ed.). *The translation studies reader* (pp. 113–118). Routledge.

Jodłowiec, M. (2012). The implicit revisited. In: A. Piskorska (Ed.), *Relevance studies in Poland, vol. 4: Essays on language and communication* (pp. 64–74). Wydawnictwa Uniwersytetu Warszawskiego.

Jorgensen, J., Miller, G., & Sperber, D. (1984). Test of the mention theory of irony. *Journal of Experimental Psychology: General, 113*(1), 112–120. https://doi.org/10.1037/0096-3445.113.1.112

Katz, A. (2009). Commentary on 'Does an ironic situation favour an ironic interpretation?'. In: J. Vandaele & G. Brône (Eds.), *Cognitive poetics: Goals, gains and gaps* (pp. 401–405). Mouton.

Kaźmierczak, M. (2017). Od przekładu intersemiotycznego do intersemiotycznych aspektów tłumaczenia. *Przekładaniec. 34*, 7–35.

Kreuz, R. & Link, K.E. (2002). Asymmetries in the use of verbal irony. *Journal of Language and Social Psychology 21*(2), 127–143. https://doi.org/10.1177/02627X02021002002

Milanowicz, A., & Bokus, B. (2020). *W krzywym zwierciadle ironii. O kobietach i mężczyznach nie wprost* [The distorted mirror of irony. About men and women non directly]. Wydawnictwa Uniwersytetu Warszawskiego.

Milanowicz, A., Tarnowski, A., & Bokus, B. (2017). When sugar-coated words taste dry: The relationship between gender, anxiety, and response to irony. *Frontiers in Psychology, 8*, 2215. https://doi.org/10.3389/fpsyg.2017.02215

Padilla Cruz, M. (2013). Meta-psychological awareness of comprehension and epistemic vigilance of L2 communication in interlanguage pragmatic development. *Journal of Pragmatics 59*(A), 117–135. https://doi.org/10.1016/j.pragma.2013.09.005

Partington, A. (2007). Irony and the reversal of evaluation. *Journal of Pragmatics, 39*, 1547–1569. https://doi.org/10.1016/j.pragma.2007.04.009

Piskorska, A. (2014). A relevance-theoretic perspective on humorous irony and its failure. *Humor, 27*(4), 661–685. https://doi.org/10.1515/humor-2014-0095

Scott, K. (2015). The pragmatics of hashtags: Inference and conversational style on Twitter. *Journal of Pragmatics 81*, 8–20. https://doi.org/10.1016/j.pragma.2015.03.015

Sperber, D. & Wilson, D. (1981). Irony and the use-mention distinction. In P. Cole (Ed.), *Radical pragmatics* (pp. 295–318). Academic Press.

Sperber, D., & Wilson, D. (1995). *Relevance: Communication and cognition* (2nd ed.). Springer.

Sproull, L. & Kiesler, S. (1986). Reducing social context cues: Electronic mail in organizational communication. *Management Science 32*(11), 1492–1512. https://doi.org/10.1287/mnsc.32.11.1492

Whalen, J. M., Pexman, P. M., & Gill, A. J. (2009). "Should be fun—not!": Incidence and marking of nonliteral language in e-mail. *Journal of Language and Social Psychology, 28*(3), 263–280. https://doi.org/10.1177/0261927X09335253

Whalen, J. M., Pexman, P. M., Gill, A. J., & Nowson, S. (2013). Verbal irony use in personal blogs. *Behaviour & Information Technology, 32*(6), 560–569. https://doi.org/10.1080/0144929X.2011.630418

Wigboldus, D., & Douglas, K. (2007). Language, stereotypes, and intergroup relations. In K. Fiedler (Ed.), *Social communication* (pp. 79–106). Psychology Press.

Wilson, D. (2006). The pragmatics of verbal irony: Echo or pretence?. *Lingua 116*, 1722–1743. https://doi.org/10.1016/j.lingua.2006.05.001

Wilson, D. (2017). Irony, hyperbole, jokes and banter. In: J. Blochowiak, C.

Grisot, S. Durrleman, & C. Laenzlinger (Eds.), *Formal models in the study of language* (pp. 201–219). Springer.

Wilson, D., & Sperber, D. (1992). On verbal irony. *Lingua, 87*(1), 53–76.

Yus, F. (2011). C*yberpragmatics: Internet-mediated communication in context.* John Benjamins

Yus, F. (2019). An outline of some future research issues for internet pragmatics. *Internet Pragmatics 2*(1), 1–33. https://doi.org/10.1075/ip.00018.yus

Yus, F. (2021). *Smartphone communication. Interactions in the app ecosystem.* Routledge.

Ziółkowski, A. (2015). A*naliza metod filozofii eksperymentalnej na wybranych przykładach* [Unpublished doctoral dissertation]. University of Warsaw, Warsaw, Poland.