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Cartoon-based Message Strategies on Vaccination in Romania and Engagement Behavior. A Multimodal Approach

Abstract

Humor has been employed by (inter)national authorities in order to simplify complex issues and to encourage behavioral changes toward certain health issues. Focusing our analysis on the cartoons employed by two Romanian authorities (The National Committee for Coordination of anti-COVID-19 Vaccination Activities, CNCAV, and The European Commission's Representation in Romania), the aims of this study are threefold: to determine how Health Belief Model (HBM) constructs and humor resources were associated with online users' online engagement behavior towards the cartoons on vaccination in Romania; to identify how multimodal modes were employed in the cartoons on COVID-19 vaccination; to determine how knowledge resources help in the interpretation of humor in the overperforming multimodal cartoons. The exploratory analysis showed that self-efficacy was a salient HBM construct in the cartoons but it was less engaging than cues to action and perceived barriers. Various forms of puns and visual metaphors as humor resources prevailed and displayed the highest level of engagement. The qualitative analysis revealed that situational irony and Horatian satire, presented in a playful tone, were mainly targeted towards anti-vaxxers and the undecided. The study also showed that a cartoon-based communication strategy should combine generalized humorous situations with socio-cultural specificity.

Keywords: humor; multimodality; cartoons; East Europe; vaccination

Introduction

Tailoring effective health messages within the context of vaccination hesitancy, criticism, and misinformation was a great challenge for (inter)national authorities during the COVID-19 vaccination campaign. Studies (Dubé et al., 2015; Vraga et. al, 2019; Su et al., 2022; Marx et al., 2023) showed that health communication practitioners should consider both fact-based scientific strategies, on the one hand, and emotional strategies through personal stories and humor, on the other hand. Humor attracts sustained attention, eliciting favorable audience response in terms of its attitude and behavior towards a particular health issue (Miller et al., 2021). But the effectiveness of a humorous message strategy depends on the socio-political context and on the seriousness of the health issue under debate. In the case of East European

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countries, a shift of humor leverage could be observed. During the communist regime, “gallows humor” (Martin & Ford, 2006, pp. 48-49) was employed as a mode of expressing “passive resistance” to oppression and of some “acts of tacit rebellion” (Popa, 2011, p. 137). A new type of humor emerged once democracy has gradually triggered East European citizens’ civic awakening. The increase in corruption (Haerpfer et al., 2022) after the fall of communism has been the main reason of protests in Romania. Dumitrica (2022, p. 188) talks about “protest humor as a symbol of democratic criticism”. Despite the collective identity that protest humor as a satirical communication strategy stirs, research (Armanca, 2017; Dumitrica, 2022) has shown the detrimental function of humor as well: the lack of seriousness associated with socio-political issues, the questionable power of humor to solve political problems, or the exclusion of those criticized by imposing hierarchies and legitimizing violence.

The COVID-19 pandemic was the context that favored online humor as a coping strategy to adapt to the uncertainty and anxiety that the new normality brought. COVID infections, preventive measures, and politics were the topics that triggered the most humorous posts in Romania (Stefani, 2020). The presence of politics among the most laughed at topics was no surprise since a 20% decline in trust was observed between May 2021 and February 2022, in the way the Romanian national authorities managed the immunization process (European Commission, 2022). Alongside the defense mechanism of humor during the pandemic in Romania, Stefani (2020) highlighted the aggressive function as well. Analyzing the interactive humor stirred by the “vaccine as a cheat sheet” metaphor as a means to simplify abstract information about COVID-19 vaccination, Negrea-Busuioc (2023) emphasizes that such a metaphor not necessarily makes scientific knowledge more accessible. The mockery associated with this metaphor amplified the polarization of the online conversation about vaccination by fueling the vaccination opponents’ use of argumentation fallacies.

Cartoons as a form of humor satirically illustrate social and political realities, often depicting stereotypes (Tsakona, 2009; Edwards, 2014). Thus, presenting the reality in a humorous way through an interplay of verbal and/or visual semiotic images and drawing on images presenting specific cultural and social settings, cartoons are considered “a legitimate, interesting, and engaging source of data” since they “represent what is said in the public arena” (Giarelli & Tulman, 2003, p. 945). Cartoons and/or comics have a multifold purpose, from entertainment to social consciousness, education, and instruction (Hendriks & Janssen, 2018; Kearns & Kearns, 2020; Alemany-Pagès et al., 2022; Matwick & Matwick, 2022).

Cartoons and/or comics have been mainly studied in the context of editorial cartoons and of public health campaigns. This study wants to contribute to the literature on the role of cartoons in health campaigns on vaccination by focusing on the cartoons employed by two Romanian authorities (The National Committee for Coordination of anti-COVID-19 Vaccination Activities, CNCAV¹, and The European Commission’s Representation in Romania) during the COVID-19 vaccination communication campaign. The aims of this study are the following: (a) to determine what Health Belief Model (HBM) constructs and humor resources received higher levels of engagement in the cartoons; (b) to identify the interplay between various modes in the Romanian cartoons on vaccination; (c) to determine how knowledge resources help in the interpretation of humor in the overperforming multimodal cartoons.

Theoretical framework and research questions

Since humor in cartoons and comics is “a powerful discursive strategy to educate the public” (Matwick & Matwick, 2022, p. 1) and since national authorities wanted a behavioral change through their vaccination communication campaigns, we will start with the assessment of the HBM elements and the humor resources in the cartoons on COVID-19 vaccination.

HBM (Diddi & Lundy, 2017; Rosenstock et al., 1988) was developed to assess individuals’ beliefs regarding health-related behaviors. HBM constructs include perceived threat (probability of acquiring a specific health condition, the seriousness of a disease), perceived benefits (the advantages of pursuing a particular health action), perceived barriers (the obstacles or costs preventing an individual to pursue a certain health action), cues to action (external stimuli prompting individuals to take a specific health action), and self-efficacy (a person’s confidence in their capacity to carry out the recommended health action).

Humor has several functions, ranging from relief and control to cohesion, contributing to “the maintenance of social order” (Kuipers, 2008, p. 370). Martin and collaborators (2003, p. 52) make the distinction between “affiliative humor”, that focuses on benevolence and self-acceptance, and “self-defeating humor”, that is detrimental and often associated with aggressive humor. Citing previous authors, Su and collaborators (2022, p. 34) consider that wordplay and anthropomorphism tend to be related to affiliative humor, whereas satire is more associated with the latter category. Although not many authors make a difference between sarcasm and satire, Martin and Ford (2016, p. 13) consider that satire is intended to poke fun at “social institutions or social policy” whereas sarcasm is targeted “at an individual than an institution”. Fine and Martin (1990, p. 97) associate sarcasm with hostility, contempt, and bitterness. In the same line, Buijzen and Valkenburg (2004) add that sarcasm is associated with “a hostile tone”, “a verbal put-down”.

Satire and sarcasm mainly focus on “poking fun” (Su et al., 2022, p. 42), critiquing “dominant belief systems” (Spicer, 2011, p. 26). A distinction is made between Horatian satire versus Juvenalian satire. Horatian satire provides a lighter social commentary in an entertaining way, being playful in tone, whereas Juvenalian satire displays a more acidic tone, focusing on aggressive judgment and contempt (Holbert et al., 2011, p. 192; Su et al., 2022, p. 35).

On the other hand, irony as “a statement in which the literal meaning is opposite to the intended meaning” (Martin & Ford, 2016, p. 13) is more associated with a mild sarcasm than with satire, leaving a comic effect (Al-Masri, 2016, p. 49). According to Spicer (2011, p. 22), irony stands for “saying the opposite of what is meant”, thus suggesting “a disjunction between reality and expectations” (Fine & Martin, 1990, p. 106). Situational irony is defined as “part of the way in which humans evaluate and deal with situations, particularly those that do not fit with the normal expectations” (Shelly, 2001, p. 814). This type of irony is present in cartoons (Ridanpää, 2012; Abdel-Raheem, 2022). Ridanpää (2012, p. 113) refers to “a more or less paradoxical contradiction or incongruity between different elements of a situation”, which defines situational irony. This type of irony involves an ironist and an observer, who interprets the situation based on their script knowledge “of what is expected to happen” (Lucariello, 2007, cited by Ridanpää, 2012, p. 113). The sociopragmatic function of humor as an imposition of social order is especially found in humorous multimodal texts employed by (inter)national authorities that want to trigger a behavioral change at a societal level. The ideology of the dominant group resides beyond these humorous multimodal texts (Dynel, 2020; Matwick & Matwick, 2022). Unlike an online vigilante humor where users are the cre-

ators (Dyner, 2020), cartoon humor in editorial cartoons and/or communication campaign is created by cartoonists who reveal their own depictions of reality (Giarelli & Tulman, 2003, p. 947). Using contradiction, irony, and controversy to get their point across, cartoonists make appeal to universal and/or local socio-cultural assumptions. The literature provides various humor types employed for the analysis of cartoons: pun, spoonerism versus irony in the analysis of editorial cartoons (Al Masri, 2016); metaphors in the analysis of political cartoons during the financial crisis (Bounegru & Forceville, 2011), or of newspaper cartoons (El Refaie, 2003), or polysemy, exaggeration, and syllepsis in humorous news (Soare, 2020). Pedrazzini and Scheuer (2019) provide a more comprehensive insight into the rhetorical resources employed in multimodal cartoons. The same authors make a distinction between figures of meaning (ranging from metonymy, metaphor to syllepsis or play on words), figures of constructions (antithesis, parallelism, or inversion, gradation), figures of thought (irony, sarcasm, or parody), and cultural references (p. 13).

Starting from the idea that “cartooning is a metaphor for the subjectivity of perception” (El Refaie, 2010, p. 171) and that the online environment brings a socially mediated authenticity (Gilpin et al., 2010), the assessment of online engagement is of paramount importance. Research (Kim & Yang, 2017; Muntinga et al., 2011) shows that the three online behaviors (liking, commenting, and sharing) are placed on a continuum that ranges from a less cognitive effort to a more cognitive effort. The following research questions were addressed:

RQ1: What HBM constructs in the cartoons on COVID-19 vaccination were associated with higher level of user engagement?

RQ2: What humor resources as rhetorical figures of meaning were associated with higher level of user engagement in the Romanian national authorities’ cartoons on COVID-19 vaccination?

In an article on visual modality versus authenticity, El Refaie (2010) makes a plea for the concept of authenticity as “an alternative approach to the relationship between images and truthfulness” (p. 165). We consider that it is important to use an approach that encompasses both the visual features of images and the producer’s oriented forms of authenticity. A multimodal analysis “provides conceptual tools that focus on the inter-connectedness between people’s agency, the technologies in use, and the social content of meaning making” (Jewitt & Henriksen, 2016, p. 161).

In our analysis we employed a multimodal theory of humor on cartoons and comics (El-Arousy, 2007; Matwick & Matwick, 2022; Tsakona, 2009) and a social semiotic multimodal analysis with three inter-connected levels (mode, design, and context) (Jewitt & Henriksen, 2016). Six knowledge resources (KR) are present in the multimodal theory of humor. The *situation* refers to the social context of the cartoon (participants, activities, objects, places etc.). *Language* focuses on the verbal/ written text that may take various forms (speech balloons, thought bubble, conversation cloud, or captions). Following El-Arousy (2007), Matwick and Matwick (2022) replace the narrative strategy with a *semiotic strategy* that focuses on the interplay between the visual and non-verbal elements and it refers to the identification of the semiotic resources potential for the particular situation. The analysis of multimodal design of texts, modal dominance, emphasis within texts, and layout is of paramount importance. When talking about *language* and *semiotic strategy*, multimodal cohesion should be taken into account. Van Leeuwen (2005, p. 230) distinguishes two types of links between image and text: elaboration relation, including either specification (both components illustrating each other) or explanation (one component paraphrasing the other); and extension relation, embedding either

similarity (image and text being similar), contrast (image and text being contrastive), or complementation (one component adding more information to the other component).

The *target* focuses on the object of the joke, whereas the *logical mechanism* presents the shared mechanism, the “distorted and playful logic” (Tsakona, 2009, p. 1173) on which the last knowledge source is built. The *script opposition* implies a reversal of truth, the dichotomies expected/unexpected, normal/abnormal, real/unreal, or possible/impossible, triggering a humorous situation (Tsakona, 2009).

We consider that a clear understanding of the meaning potential of the six knowledge resources in a cartoon relies on the multimodal approach to context (Al-Masri, 2016). The author identifies three sub-contexts: (a) the macro-context (“the socio-cultural mode or the general knowledge shared between the cartoonist and (...) readers”, p. 46); (b) the micro-context (the verbal model, meaning “the representation of the cartoonist’s subjectivity and his unique way of representing his message to the audience”, p. 46); (c) the dynamic context (the visual mode, enriching the verbal mode through an objective assessment of the physical features of objects or persons). The following research question was addressed:

RQ3: How were the knowledge resources employed in the top three overperforming multimodal cartoons?

Methodology

Data collection. Two public Facebook pages of Romanian national authorities employed cartoons as a creative strategy to trigger vaccination behavioral changes: ROVaccinare/ ROVaccination² and the European Commission’s Representation in Romania/ECRR³. All cartoons were created by the same cartoonist, Costel Pătrășcan. We used CrowdTangle to collect all the Facebook posts from these two public Facebook pages and after curating the data, our corpus was formed of 50 multimodal Facebook posts embedding cartoons ($N = 8$, ROVaccination and $N = 42$, the European Commission’s Representation in Romania – ECRR). CrowdTangle, a public tool from Meta, provided insights into the number of likes and followers at the time of posting and into the interactions for each Facebook post (likes, comments, shares, and reactions). Following Bonsón and Ratkai (2013), liking is associated with popularity, commenting with commitment, and sharing with virality.

In the first stage of the research we performed a content analysis of the cartoons in order to identify the salience of the HBM constructs and the humor resources employed on both Facebook pages.

The coding scheme for the HBM constructs focused on perceived threats (potential side-effects of the vaccine), perceived benefits (individual – self-protection *versus* collective – protection of others), perceived barriers (obstacles, fears preventing the represented participants to get the jab), cues to action (external appeals convincing people to get vaccinated), and self-efficacy (reluctance *versus* confidence in vaccination).

The coding scheme for the humor resources included four forms of meaning as developed by Pedrazzini and Scheuer (2019):

- polysemy – humorous usage of a polysemous words (e.g., hand/ arm as an upper body part and expressions such as “on the one hand, on the other hand”, or “a helping hand”).
- syllepsis – a form of pun activating a grammatical incongruity between two words in an adjacent relation. These words have different meanings, often literal and figurative (Pe-

drazzini & Scheuer, 2019, p. 7). For example, in a cartoon, a reporter is asking a Romanian citizen – “How will you travel in Europe? By bus or by plane” and the citizen says: “With the digital certificate”. Soare (2020, p. 56) associates two linguistic phenomena with this humor resource: hyper-understanding and non-understanding.

– metaphor – a multimodal figure that focuses on the replacement of an expected element by an unexpected one. El Refaie (2003, p. 91) emphasizes the importance of the context expressed through the verbal mode in the interpretation of visual metaphors. Anthropomorphism is a humor technique where objects or animals are invested with human features (Buijzen & Valkenburg, 2004, p. 153). For example, in a cartoon, the human features of vaccinated persons were mapped upon animals (goat kids), thus highlighting a well-known 1875 Romanian story (“The goat and her three kids”).

– synecdoche – a verbal or visual figure showing a part that stands for a whole (e.g., in a cartoon, a man is holding a car door saying “I came to get the jab at drive thru, but I do not have a car”).

Since Pedrazzini and Scheuer (2019, p. 107) talk about rhetorical density in cartoons where various resources coexist, the qualitative analysis of Romanian multimodal cartoons also took into account situational irony and Horatian satire as figures of thought and generic/global versus Romanian/local cultural references. These cultural references were associated with intertextual elements that involved either a commonly shared knowledge on well-known fairy tale characters (Red Riding Hood) or superheroes (Batman) or a specific shared background knowledge characteristic to Romania (Romanian fairy tales or idiomatic expressions).

Since the sample size was small, descriptive analysis (performed with Stata 18.0) was performed to obtain the mean values for each type of interactions and HBM constructs and humor resources.

To identify the overperforming cartoons, the overperforming scores (OR) for each cartoon were extracted from CrowdTangle’s metrics, indicating the diffusion performance of the respective post. OR is calculated by comparing a specific post with the interaction of the last posts in the same account, the score being the ratio of actual total interaction of the post and the expected interaction of the respective post (CrowdTangle, 2016).

A multimodal analysis of the top three cartoons with the highest overperforming score was performed for the two Romanian authorities. The multimodal analysis focused on the identification of the six knowledge resources (situation, language, semiotic strategy, target, logical mechanism, script opposition).

Findings

HBM constructs and online engagement

RQ1 asked which HBM constructs were associated with the highest user engagement. On ECRR Facebook page, “self-efficacy” ($N = 20$) was the most frequent HBM construct followed by “perceived barriers” ($N = 12$), “perceived benefits” ($N = 5$), and “cues to action” ($N = 5$). As observed in Table 1, self-efficacy was not associated with a high level of engagement. Liking, sharing, and laughing were the top three interactions for all four HBM constructs. Although “cues to action” was one of the least used HBM constructs, the posts focusing on this HBM construct had the highest mean values for six online behaviors (comments, likes,

love, wow, and care), followed by “perceived barriers” which received the highest virality (shares – $M = 246.4$, $SD = 148.3$) and reactions of laughter ($M = 191.8$, $SD = 120.8$).

Table 1. HBM constructs and user engagement (European Commission’s Representation in Romania /ECRR Facebook page)

	<i>Perceived benefits</i> ($N = 5$)	<i>Perceived barriers</i> ($N = 12$)	<i>Cues to action</i> ($N = 5$)	<i>Self-efficacy</i> ($N = 20$)
<i>Likes</i>	$M = 336.25$, $SD = 260.16$	$M = 251.6$, $SD = 127.8$	$M = 458.8$, $SD = 214.2$	$M = 256.85$, $SD = 204.1$
<i>Comments</i>	$M = 21.3$, $SD = 32.72$	$M = 7.8$, $SD = 3.56$	$M = 35.6$, $SD = 26.06$	$M = 8.65$, $SD = 8.00$
<i>Shares</i>	$M = 168.16$, $SD = 121.2$	$M = 246.4$, $SD = 148.3$	$M = 235$, $SD = 140.7$	$M = 173.35$, $SD = 142.6$
<i>Love</i>	$M = 7.91$, $SD = 7.27$	$M = 5.2$, $SD = 4.43$	$M = 8.4$, $SD = 7.3$	$M = 6.1$, $SD = 7.01$
<i>Wow</i>	$M = 0.66$, $SD = 0.88$	$M = 1.6$, $SD = 1.94$	$M = 2$, $SD = 1.87$	$M = 0.75$, $SD = 0.91$
<i>Haha</i>	$M = 53.08$, $SD = 65.10$	$M = 191.8$, $SD = 120.8$	$M = 180.2$, $SD = 128.4$	$M = 92.6$, $SD = 82.79$
<i>Sad</i>	$M = 0.66$, $SD = 0.88$	$M = 2.50$, $SD = 1.87$	$M = 2$, $SD = 2.34$	$M = 0.45$, $SD = 0.6$
<i>Angry</i>	$M = 3.41$, $SD = 3.55$	$M = 2.4$, $SD = 1.67$	$M = 6$, $SD = 4.63$	$M = 2$, $SD = 1.25$
<i>Care</i>	$M = 1.91$, $SD = 1.72$	$M = 1.4$, $SD = 1.14$	$M = 2.2$, $SD = 0.83$	$M = 1.9$, $SD = 2.14$

On the ROVaccination Facebook page, four HBM constructs were employed (Table 2): “self-efficacy” ($N = 3$), “cues to action”, “perceived benefits” ($N = 2$, each), and “perceived barriers” ($N = 1$). Unlike the engagement in the ECRR posts, where sharing was the second online behavior with the highest means values for all HBM constructs, the ROVaccination posts embedding “perceived barriers” and “self-efficacy” triggered more laughter than sharing. The descriptive analysis showed that users were inclined to like and share more cartoons that included “cues to action” but they preferred to comment more on those embedding “perceived barriers”. In terms of reactions, laughter was the online behavior with the highest engagement, “perceived barriers” receiving more haha reactions ($M = 404.5$, $SD = 135.0$) than the other HBM constructs.

Table 2. HBM constructs and user engagement (ROVaccination Facebook page)

	<i>Perceived benefits</i> (N = 2)	<i>Perceived barriers</i> (N = 1)	<i>Cues to action</i> (N = 2)	<i>Self-efficacy</i> (N = 3)
<i>Likes</i>	<i>M</i> = 940.5, <i>SD</i> = 317.4	<i>M</i> = 628.5, <i>SD</i> = 525.3	<i>M</i> = 1066, <i>SD</i> = 275.7	<i>M</i> = 840, <i>SD</i> = 382.8
<i>Comments</i>	<i>M</i> = 66.5, <i>SD</i> = 31.8	<i>M</i> = 127, <i>SD</i> = 38.1	<i>M</i> = 92, <i>SD</i> = 22.6	<i>M</i> = 50.6, <i>SD</i> = 20.7
<i>Shares</i>	<i>M</i> = 121, <i>SD</i> = 1.4	<i>M</i> = 147.5, <i>SD</i> = 3.5	<i>M</i> = 216, <i>SD</i> = 131.5	<i>M</i> = 127, <i>SD</i> = 77.2
<i>Love</i>	<i>M</i> = 26, <i>SD</i> = 1.4	<i>M</i> = 8, <i>SD</i> = 9.8	<i>M</i> = 26, <i>SD</i> = 9.8	<i>M</i> = 26, <i>SD</i> = 13.4
<i>Wow</i>	<i>M</i> = 0.5, <i>SD</i> = 0.7	<i>M</i> = 4, <i>SD</i> = 4.2,	<i>M</i> = 2, <i>SD</i> = 0.1	<i>M</i> = 2, <i>SD</i> = 1.73
<i>Haha</i>	<i>M</i> = 24, <i>SD</i> = 8.4	<i>M</i> = 404.5 <i>SD</i> = 135.0	<i>M</i> = 198, <i>SD</i> = 244.6	<i>M</i> = 228.3, <i>SD</i> = 250.8
<i>Sad</i>	<i>M</i> = 10.5, <i>SD</i> = 14.8	<i>M</i> = 4.5, <i>SD</i> = 0.70	<i>M</i> = 0.5, <i>SD</i> = 0.70	<i>M</i> = 0.33, <i>SD</i> = 0.57
<i>Angry</i>	<i>M</i> = 3, <i>SD</i> = 2.82	<i>M</i> = 4, <i>SD</i> = 1.41	<i>M</i> = 2.5, <i>SD</i> = 0.70	<i>M</i> = 3, <i>SD</i> = 1.73
<i>Care</i>	<i>M</i> = 5, <i>SD</i> = 0.1	<i>M</i> = 3.5, <i>SD</i> = 0.70	<i>M</i> = 7, <i>SD</i> = 5.6	<i>M</i> = 4, <i>SD</i> = 1

Humor resources and online engagement

RQ2 focused on the analysis of humor resources and engagement in the cartoons on COVID-19 vaccination. As observed in Table 3, syllepsis (*N* = 19) and metaphor (*N* = 11) were the most employed humor categories in the ECRR cartoons. As in the case of HBM constructs, all four humor resources triggered liking, sharing, and laughter as online behaviors with the highest level of engagement. The descriptive analysis showed that posts embedding syllepsis received more likes and comments but, at the same time, negative reactions (sadness and anger), whereas posts focusing on synecdoche received more shares and reactions of laughter.

Table 3. Humor resources and user engagement (European Commission's Representation in Romania/ ECRR Facebook page)

	<i>Polysemy</i> (N = 9)	<i>Metaphor</i> (N = 11)	<i>Syllepsis</i> (N = 20)	<i>Synecdoche</i> (N = 2)
<i>Likes</i>	<i>M</i> = 325.33, <i>SD</i> = 222.49	<i>M</i> = 246.18, <i>SD</i> = 181.82	<i>M</i> = 335.15, <i>SD</i> = 245.76	<i>M</i> = 192.5, <i>SD</i> = 127.99
<i>Comments</i>	<i>M</i> = 10.22, <i>SD</i> = 8.35	<i>M</i> = 9.27, <i>SD</i> = 7.79	<i>M</i> = 21.75, <i>SD</i> = 29.55	<i>M</i> = 8.5, <i>SD</i> = 10.61
<i>Shares</i>	<i>M</i> = 196.78, <i>SD</i> = 159.98	<i>M</i> = 130.55, <i>SD</i> = 77.54	<i>M</i> = 206.3, <i>SD</i> = 129.81	<i>M</i> = 279.5, <i>SD</i> = 327.39
<i>Love</i>	<i>M</i> = 8.89, <i>SD</i> = 8.27	<i>M</i> = 7.45, <i>SD</i> = 7.55	<i>M</i> = 5.95, <i>SD</i> = 5.83	<i>M</i> = 2, <i>SD</i> = 1.41
<i>Wow</i>	<i>M</i> = 0.67, <i>SD</i> = 0.87	<i>M</i> = 1.27, <i>SD</i> = 1.01,	<i>M</i> = 1, <i>SD</i> = 1.52	<i>M</i> = 0.5, <i>SD</i> = 1.71
<i>Haha</i>	<i>M</i> = 80.11, <i>SD</i> = 76.05	<i>M</i> = 95.09 <i>SD</i> = 102.82	<i>M</i> = 114.9, <i>SD</i> = 104.27	<i>M</i> = 142, <i>SD</i> = 181.02
<i>Sad</i>	<i>M</i> = 0.89, <i>SD</i> = 1.05	<i>M</i> = 0.55 <i>SD</i> = 0.69	<i>M</i> = 1.15, <i>SD</i> = 1.66	<i>M</i> = 0, <i>SD</i> = 0
<i>Angry</i>	<i>M</i> = 1.67, <i>SD</i> = 0.71	<i>M</i> = 2.36, <i>SD</i> = 2.38	<i>M</i> = 3.95, <i>SD</i> = 3.49	<i>M</i> = 1.5, <i>SD</i> = 0.71
<i>Care</i>	<i>M</i> = 2, <i>SD</i> = 1.73	<i>M</i> = 2.27, <i>SD</i> = 2.65	<i>M</i> = 1.65, <i>SD</i> = 1.23	<i>M</i> = 1.5, <i>SD</i> = 2.12

The cartoons on ROVaccination Facebook page (Table 4) embedded visual metaphors and polysemy and syllepsis as forms of puns. After liking, laughing was the second most used behavior by online users interacting with the cartoons embedding metaphors and syllepsis. The comparative analysis of the mean values indicated that syllepsis received the highest number of comments and shares whereas polysemy triggered more likes, reactions of laughter, surprise, and anger.

Table 4. Humor resources and user engagement (ROVaccination Facebook page)

	Polysemy (<i>N</i> = 3)	Metaphor (<i>N</i> = 2)	Syllepsis (<i>N</i> = 3)
Likes	<i>M</i> = 1233.33, <i>SD</i> = 60.1	<i>M</i> = 659, <i>SD</i> = 372.78	<i>M</i> = 704.33, <i>SD</i> = 153.42
Comments	<i>M</i> = 130, <i>SD</i> = 109.42	<i>M</i> = 50.67, <i>SD</i> = 58.03	<i>M</i> = 142, <i>SD</i> = 66.57
Shares	<i>M</i> = 165, <i>SD</i> = 114.71	<i>M</i> = 143, <i>SD</i> = 108.54	<i>M</i> = 186.5, <i>SD</i> = 153.44
Love	<i>M</i> = 28, <i>SD</i> = 12.53	<i>M</i> = 19.33, <i>SD</i> = 8.14	<i>M</i> = 18.67, <i>SD</i> = 3.51
Wow	<i>M</i> = 3, <i>SD</i> = 4.36	<i>M</i> = 1, <i>SD</i> = 1	<i>M</i> = 2.33, <i>SD</i> = 1.53
Haha	<i>M</i> = 281.67, <i>SD</i> = 456.68	<i>M</i> = 133.67, <i>SD</i> = 123.98	<i>M</i> = 230.67, <i>SD</i> = 247.95
Sad	<i>M</i> = 3.33, <i>SD</i> = 4.93	<i>M</i> = 7.33, <i>SD</i> = 11.85	<i>M</i> = 0, <i>SD</i> = 0
Angry	<i>M</i> = 4.67, <i>SD</i> = 3.51	<i>M</i> = 1.33, <i>SD</i> = 1.53	<i>M</i> = 3.33, <i>SD</i> = 1.15
Care	<i>M</i> = 4.67, <i>SD</i> = 1.53	<i>M</i> = 5.33, <i>SD</i> = 0.58	<i>M</i> = 4, <i>SD</i> = 1

Multimodal analysis of overperforming cartoons

The last research question focused on the multimodal analysis of the top three cartoons with the highest overperforming score (OS) for both Romanian authorities.

Figure 1. ROVaccinare/ ROVaccination, October 24, 2021. The speech balloons read: “Why didn’t you take the jab?”, the answer – “I am afraid of needles”. Copyright: Costel Pătrășcan⁴ 	Figure 2. ROVaccinare/ ROVaccination, April 30, 2021. The speech balloons read: “What are they selling?”, the answer – “Vaccine”. Copyright: Costel Pătrășcan 	Figure 3. ROVaccinare/ROVaccination, March 27, 2021. The speech balloon reads: “He got the jab. He is immune...”. Copyright: Costel Pătrășcan 

The ROVaccination cartoon (Figure 1) with the best overperforming score (OS = 5.64) and the highest number of laughter reactions humorously presents the *situation* of a “perceived barrier”, illustrating a reporter asking a dressmaker while she is sewing: “Why didn’t you get the jab?” and the woman answering: “I am afraid of needles”. Focusing on the polysemy of the word “needle” (sewing needle *versus* syringe needle), the cartoonist wanted to satirize the anti-vaxxers. The *semiotic strategy* explains the *language* component formed of the two above-mentioned jab lines. The visual mode emphasizes the dynamic context through the visual representation of a dressmaker using a sewing needle. The dressmaker, as the *target* of humor, finds a non-plausible excuse (their fear of needles) in not getting the jab. This is actually the basis of the *logical mechanism* beyond this pun. Employing a situational irony, the cartoonist focuses his *script opposition* on something unexpected: someone using needles for her job is afraid of needles. The dressmaker’s noncompliance with the desired behavior of getting the vaccine highlights an absurd situation: through their ridiculous excuse, the dressmaker seems to be portrayed as the voice of stupidity, representing the vaccine opponents who could provide even unexpected arguments to display their reluctance to vaccination.

The following overperforming (OS = 4.45) and the most shared cartoon (N = 309 shares) brings forth a referenced *situation* (people queuing) closely linked to the communist regime (Figure 2). The cartoonist illustrates people queuing to get the jab. Someone holding a shopping bag, joins the queue asking what is sold as merchandise and a man is saying “Vaccine”. The *language* is formed of two jab lines: a question (“What are they selling?”) and an answer (“Vaccine!”). The information value of *semiotic strategies* is obtained through the coherence between the visual representation of a straight line and the punch lines and it enhances the dynamic context of queuing as a social practice. The *target* of humor is the woman who wants to stand in line because she thought that new merchandise was brought. The *logical mechanism* and *script opposition* reside in the understanding of the abnormal situation depicted in the cartoon that highlights the macro context shared between the cartoonist and the online Romanian users. In normal circumstances, people stand in line for desirable merchandise or shortage of goods. In the cartoon, the response of the man in line shows a reversal of the understanding of merchandise revealing a situational irony. Thus, there is a clash between the expected answer and the actual answer. The unexpected *script opposition* relies on queuing at local shops as a social practice during the communist rule, a practice that could be labeled as “a postmemory in place” (Crețan & Doiciar, 2023, p. 680). The cartoonist used the association (vaccine as a merchandise) recontextualizing the vaccine center as a site connected to everyday life (local shop) and thus trying to convince viewers to get the jab.

The third most overperforming cartoon (OS = 3.17) posted by ROVaccination presents the context of a domestic *situation*, the husband reading a newspaper and his wife knitting while sitting in an armchair (Figure 3). After having shot two arrows in the man’s back, Cupid is surprised that the man has no reaction to his arrows. His wife is explaining to Cupid that her husband got the jab and that is why he is immune. The *language* and the *semiotic strategy* complement each other, bringing a clarification on the lack of man’s reaction. The left *versus* right representation of the two family members who are not talking to each other displays an atmosphere of indifference and of routine that Cupid wants to change. But his act of stirring the man’s interest in falling in love with his wife again seems to be futile and the woman says to Cupid, “He got the jab and he is immune...”. Thus, the *target* of the irony is Cupid who is bewildered because his arrows do not have the desired effect. The *logical mechanism* and *script opposition* start with a universal shared knowledge on the meaning potential of

Cupid’s arrows. The situational irony comes from the syllepsis operating in the verbal and visual modes of the cartoon. Activating two different contextual meanings for the word “immune”, the cartoonist humorously illustrates the unexpected lack of efficacy of Cupid’s arrows, emphasizing the surprising effectiveness of COVID-19 immunization not only against the pandemic but also against love.

Figure 4. The speech balloons read: “Are you getting the jab?”, “Do I have a choice?” “Of course: Pfizer, AstraZeneca, Moderna, Johnson & Johnson” (Oct. 30, 2021)
Copyright: European Commission’s Representation in Romania and Costel Pătrășcan⁵



Figure 5. The speech balloon reads: “What’s in your hand is not a lie. (Oct. 27, 2021)
Copyright: European Commission’s Representation in Romania and Costel Pătrășcan



Figure 6. The speech balloon reads: “How can we get out of pandemic?”. A man is pointing at a door where there is a sign with the label “Vaccine”. (Oct 21, 2021)
Copyright: European Commission’s Representation in Romania and Costel Pătrășcan



The best overperforming cartoon (OS = 2.86) on the European Commission’s Representation in Romania Facebook page generated the highest number of laughter reactions and illustrates a humorous representation of cues to action through a reinterpretation of freedom of choice (Figure 4). The *situation* depicts two men sitting on a bench in a park, one of them asking the other if he will get the jab. He replies that he has no choice. The former replies “Of course: Pfizer, AstraZeneca, Johnson & Johnson”. The information value of the *semiotic strategy* shows a left to right visual distribution specific to a face-to-face dialogue that is enhanced by the *language* in the punch lines (participant A: “Are you going to get the jab?”, participant B: “Do I have a choice?”, participant A: “Of course: Pfizer, AstraZeneca, Moderna, Johnson & Johnson”). The *target* of humor is participant B who gets an unexpected answer to his submissive reply. The *logical mechanism* and the *script opposition* interplay to make the cartoon funny. Under normal circumstances, the punch line “Do I have a choice?” should have got a reply focusing on pro arguments for getting the jab. The whole situation is an interplay between syllepsis and situational irony. The word “choice” relies on hyper-understanding as a linguistic phenomenon, the speaker having the ability “to exploit (the) potential weak points in a previous speaker’s utterance by playfully echoing that utterance while simultaneously reversing the initially intended interpretation” (Brône, 2008, p. 2027). The Horatian satire in participant A’s punch line is meant as a stereotype of the undecided who complain of having their civil liberties violated but who actually are given at least three choices to pick up from. But at the

same time, participant A's humorous answer depicts an imposition on the freedom of choice, the possibility of not getting the jab being out of the question.

The *situation* in the second best overperforming ECRR cartoon (OS = 2.72) shows an instance of individual self-efficacy (Figure 5), illustrating a doctor vaccinating a man while saying: "What's in your hand is not a lie". The *language* of the jab line and the *semiotic strategy* complement each other, the image of the man getting the jab being the humorous visual representation of the idiomatic expression created through the polysemous word "hand". Two hands are visually depicted. On the one hand, we have the hand of the authority (the doctor) that is intended not to be a lie and the hand of the patient who might feel the vaccine as dangerous. But the transactional act (the actual inoculation of the vaccine) shows that the patient is willing to believe in the efficacy of the COVID-19 vaccine. The *target* of humor is the man getting the jab who seems surprised by the doctor's words. The *script opposition* focuses exactly on the clash between what is expected to take place during a conversation between a doctor and a patient and the situation depicted in the cartoon. The *logical mechanism* relies on the fact that in normal circumstances the doctor may tell a patient what type of vaccine he administered. In this cartoon, the doctor provides an implicit qualifier of the vaccine, labeling it as not a lie. The macro context plays an important role in the meaning potential of the play upon the word "hand". Conspiracy theorists believe that COVID-19 vaccine is a serum, or an experiment. The doctor in the cartoon intends to debunk this myth emphasizing, through the idiomatic expression, the urge of not getting lured by anti-vaxxers' arguments. Thus, the undecided viewer could get convinced by the instance of individual self-efficacy represented by the man getting the jab.

The third overperforming ECRR online cartoon (OS = 2.55) presents the collective benefit of COVID-19 vaccination through the employment of situational irony (Figure 6). The *situation* depicts a family asking another person "How can we get out of pandemic?" and the person points to a door where there is a sign with the label "Vaccine". The humor resides in the incongruity between the expectation of the persons asking and the gesture of the man pointing at the door where the vaccine is administered. This incongruity is obtained through an extension relation focusing on *language* (the recontextualization of the word "get out") and the *semiotic strategy* (the display of information value: left – the family *versus* right – the door with the sign "Vaccine"). This left *versus* right display of the represented participants may have the meaning potential of past (pandemic) *versus* future (vaccination). The *target* of humor is the family who seems to be bewildered by the man's unexpected nonverbal gesture. The *logical mechanism* and *script opposition* show a clash between the family's script suggesting one reality (a quest for solutions to end the pandemic) and the other man's script reflecting the denotative meaning of the action of getting out. The man's pointing towards a door with the sign "Vaccine" constitutes an unexpected switch from the script of the undecided who may not have considered vaccination as a potential solution to the script of a concrete solution (the room where one can get the jab).

Discussion and conclusions

Humor has been studied in Romanian mediascape context mainly related to a strategy of nonviolent form of resistance to oppression during the communist regime, to a symbol of democratic criticism during various protests, or to a coping mechanism during the pandem-

ic. This article contributes to the research associated to humor through cartoons in public health campaigns by mapping “the landscape of humorous scientific social media content” (Su et al., 2022, p. 46) in a country from Eastern Europe. Two main aspects will be discussed related to cartoons in Romanian public health campaigns on vaccination: the communicative function of cartoons as a message strategy and the socio-cultural relevance of knowledge resources in the cartoon scripts.

Communicative function of cartoons

Our findings suggested a salience of “self-efficacy” and “perceived barriers” in the cartoons of both Romanian authorities (ROVaccination, and The European Commission’s Representation in Romania), but “perceived benefits” and “cues to action” were also employed. The interplay of HBM constructs in the cartoons is partially in line with previous research (Guidry et al., 2017; Onuora et al., 2021; Petersen et al., 2021) showing that authorities should tailor their messages around the citizens’ perceived threats regarding vaccination, and their fears of vaccines, but this should be intertwined with benefits. This combination between the acknowledgment of risks and emphasis on benefits may be an effective communication strategy and, in the long run, it may result in a rise in public confidence in authority (Petersen et al., 2021).

The examination of the humor resources employed by the two Romanian authorities revealed that syllepsis, polysemy, and metaphors were the most employed forms of humorous meaning. This finding is consistent with previous research showing that various forms of puns are most frequent in political cartoons (Soare, 2020, p. 53, 56) or in scientific-related tweets (Su et al., 2022, p. 47).

Liking, sharing, and laughter were the most dominant types of online behavior in the cartoons posted on the Facebook pages of the two authorities. The exploratory analysis showed that commenting was not an online behavior as frequently used as liking, sharing, and laughter in the cartoon-based health communication strategy. Interestingly, sharing as a strategic behavior, revealing more self-presentation (Kim & Yang, 2017) than the other forms of interactions was more associated with posts embedding “perceived barriers”, “cues to action”, and “puns”. Although it is expected for a pro-vaccination campaign to focus on posts embedding “self-efficacy”, the exploratory analysis showed that this type of HBM construct did not receive the highest engagement, “cues to action” and “perceived barriers” being more engaging. Thus, setting an example seems to bring less virality than critiquing the anti-vaxxers and the undecided for their vaccination reluctance. This focus on an implicit negative portrayal of people opposing a recommended behavior is consistent with the findings in Labbé and collaborators’ study (2022). The representation of the “othering process” may have a twofold consequence: either as a strategy to encourage compliance to the recommended rules and measures or as a strategy to increase polarization (Labbé et al., 2022, p. 9).

Several discrepancies were noticed between the behavior of Romanian users in relation to the cartoons employed by the two authorities. Whereas ECRR cartoons focusing on “perceived barriers” had more shares, the ROVaccination cartoons received more likes and shares when embedding cues to action and more comments when focusing on perceived barriers. This discrepancy could be explained in terms of the role played by the two authorities in the national vaccination management. Romanian users were inclined to comment more on the

ROVaccination Facebook page trying to send messages to the national authority in charge of vaccination.

This exploratory analysis of cartoons related to COVID-19 vaccination in Romania has revealed the macro ideology of worldwide authorities throughout the COVID-19 pandemic: to get at least 70% of the world's population vaccinated by June 2022 (WHO, 2021). The social order during this crisis could have been restored if herd immunization were achieved and if non-compliance to vaccination were addressed. Self-efficacy was obtained through the visual depiction of various persons or groups getting the jab: from stereotypical representations of people queuing to get vaccinated to metaphorical representations of well-known (inter)national heroes and fairy tale characters. Perceived barriers expressed through various forms of puns were meant to humorously highlight the incongruity beyond the excuses of the undecided and anti-vaxxers in an attempt to change their behavior towards vaccination.

The socio-cultural relevance of knowledge resources in the cartoon scripts

The multimodal analysis of the cartoons showed that the various figures of humorous meaning coexist with forms of thought and cultural references as noted by Pedrazzini and Scheuer (2019) in their analysis of the functioning of rhetoric resources in multimodal cartoons. Situational irony and Horatian satire were present in the humorous representations of the anti-vaxxers and the undecided on both Facebook accounts. Although Su and collaborators (2022, p. 35) consider that “media studies are more aligned to Juvenalian satire than its Horatian counterpart”, such a remark should be contextualized. The aggressive Juvenalian satire may be a feature of political cartoons but Horatian satire, where the truth is told with a smile (Holbert et al., 2011), may be a characteristic of cartoons in health communication campaigns. The playful tone takes the form of an implicit social commentary against some groups (e.g., anti-vaxxers) that are reluctant to the behavioral change.

The findings of the multimodal analysis of humor in the six best overperforming cartoons were in line with previous studies (Matwick & Matwick, 2022), showing a prevalence of generalized setting and character types. The Romanian viewers engaged more with a stereotypical representation of participants and a global tendency towards COVID-19 vaccination reluctance. This vaccine hesitancy was also reflected in the leverage of “cues to action”, “potential benefits” and “perceived barriers” depicted in the six best overperforming Romanian cartoons analyzed in the study. However, only two of these cartoons incorporated self-efficacy as a component of the Health Belief Model (HBM). The lack of socio-cultural specificity was also noted at the level of the multiple meanings of the words on which puns were created, the words displaying the same polysemy both in Romanian and in English (e.g., needle, immune, choice, hand, or get out). Despite this dominance of generalization, the most shared ROVaccination cartoon embedded a situational irony of a specific socio-cultural context evoking the former communist practice of queuing, the vaccine being recontextualized as valuable merchandise.

This study has theoretical and practical implications. It contributes to the literature on multimodal approaches to cartoons as multimodal texts in health campaigns and on the communicative functions of cartoons as a message strategy. Our findings suggested the lack of “perceived threats” as an important element in the interplay of HBM constructs, with Romanian cartoons laying an emphasis on “perceived barriers”, “cues to action”, “benefits”, and “self-efficacy” to educate the public. Although the literature on public health campaigns emphasizes

the importance of acknowledging online users' fears, the lack of threats and severity as communicative functions is also mentioned in other studies on comics in health campaigns (Matwick & Matwick, 2022). Future studies may reveal whether this exclusion of negative HBM constructs from public health campaigns leveraging humorous texts is a constant or a specific feature. Although negative constructs do not prevail, perceived barriers seem to have an important engaging role. Therefore, alongside the educational communicative goal, cartoons in health communication campaigns have a satirical role of portraying the "otherness" embodied in persons reluctant to a behavioral change. This is in line with what Matwick and Matwick (2022) label as the function of the "made-up world" of cartoons that make possible "to address unpleasant topics" in a "more relatable and memorable" way (p. 10).

The multimodal approach to cartoons focused on health issues should place greater emphasis on the macro-context, highlighting whether a generalized *versus* specific socio-cultural relevance prevails. Romanian communication practitioners should take into account that cartoons embedding "perceived barriers" and "cues to action" depicted under the form of situational irony and Horatian satire received more shares. Therefore, this type of engagement shows that users may display a greater cognitive effort (Kim & Yang, 2017) materialized as sharing when viewing this type of cartoons.

Although the results showed a dominance of cartoons embedding generalized humorous situations, it is important to note that the cartoon focusing on a Romanian communist specific habit generated the highest virality through sharing. Thus, we may conclude that practitioners should include an interplay between generalization and socio-cultural specificity when tailoring their health message strategy through cartoons.

This study has several limitations. The selection of the public data from both Facebook accounts was narrowed only to cartoons and an analysis on all humor mechanisms displayed in other visual and verbal forms may provide a more comprehensive insight into humor related to vaccination in Romania. Our analysis focused on the exploratory analysis of the engagement behavior of cartoons but the analysis of the online efficacy of cartoons could be supplemented by an analysis of the comments to these cartoons in order to bring a broader picture to online users' perceptions of cartoons as a message strategy. The micro-context within the multimodal analysis of the cartoons was tackled through the cartoonist's semiotic strategy but we consider that an interview with the cartoonist might help us in identifying his choices of the semiotic resources in depicting the humorous situations in the cartoons on COVID-19 vaccination.

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Notes

¹ CNCAV, the National Committee for Coordination of anti-COVID-19 Vaccination Activities, was formed of representatives from various ministries among which the Ministry of Health and the Ministry of Internal Affairs.

² ROVaccinare/ ROVaccination (<https://www.facebook.com/ROVaccinare>) was the official Facebook page where the vaccination campaign was promoted in Romania. This page was administered by CNCAV.

³ <https://www.facebook.com/comisia.europeana.in.romania>

⁴ All cartoons included in this article were reproduced with permission from the author, Costel Pătrășcan.

⁵ All cartoons included in this article were reproduced with permission from European Commission's Representation in Romania and the author, Costel Pătrășcan.

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