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# Assessing the “virality” of a road safety communication campaign intended to change behavior: a case study in Spain

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**Introduction:** The relationships between above-the-line (ATL) and below-the-line (BTL) communication and advertising strategies have been studied in many fields and procedures. Likewise, the interrelationships between both communicative typologies, when they exist, either strategically induced or spontaneously, are also known concerning their reinforcing effects. However, in the social communication field, specifically road safety communication, these interrelationships have been little studied, and few case studies have been done, particularly of those that have stood out as particularly significant.

**Methods:** Thus, this paper investigates the implementation process of an ATL awareness campaign of the Spanish Traffic Authority (DGT-General Directorate of Traffic) through the analysis of key digital reach indicators.

**Results:** Despite the foreseeable limitations of this research regarding the repercussions and positive impact on society of the DGT communication campaign, it is nevertheless a contribution of interest regarding the digital impact that has been generated in networks (BTL communication) from a DGT campaign broadcast on various media such as television, radio, posters, and social networks.

**Discussion:** Thus, from a methodology based on an exact delimitation (two DGT TV spots -from 2022- generating a quantitative activity on X (formally Twitter) that had never before produced DGT spots), significant conclusions and results have been reached related to issues of age groups, loyalty and distortion of messages, communication impact strategies, among others.

## KEYWORDS

communication, advertisement, social media, Above The Line, Below The Line, road safety, Spain

## 1 Introduction

Social advertising refers to the use of strategies, techniques and tools for the sale of products or services for the modification of attitudes or behaviors of citizens in favor of a better coexistence and public health (Domegan, 2021). Government authorities and private entities invest millions of euros in social advertising year after year (Bloom et al., 2018). Promoting healthy attitudes and behaviors is the basis for preventing a large part of the population's health, social and economic problems (Andreassen, 1995). In this sense, campaigns are frequently carried out to raise awareness on issues as diverse as recycling, gender violence, bullying, or disease prevention (Saunders et al., 2015). One of the issues on which most advertising campaigns and spots have been developed is traffic accidents. Almost a century ago, campaigns began to be broadcast to warn of the dangers of the road and to inform road users about risky behaviors to be avoided (Faus et al., 2023a).

The traditional media were mainly responsible for disseminating these advertisements. Television, radio and print were, and still are, direct and effective channels to target the viewer (James et al., 2013). However, over the last few years, the internet has revolutionized communication. Particularly, social networks are media with which it is possible to interact with users and transmit relevant information at a lower economic cost than traditional media (Blair, 2017). In this sense, the use of Above The Line (ATL) strategies, which refer to campaigns aimed at the entire population, has prevailed (Kumar et al., 2016). However, in recent years it has been shown that using channels such as X (formally Twitter) in awareness campaigns could be a great option for young people to obtain information and healthy behavior patterns, given the high prevalence of the use of social networks in this population group, and the, increasingly, reduction in their consumption of traditional media (Reid-Chassiakos et al., 2016). Therefore, Below The Line (BTL) campaigns have been developed, which target a specific population group that is a regular consumer of this media, for which it is necessary to adapt the communication strategy to the characteristics of that audience (Lazo, 2014).

In this regard, several evaluations of public health campaigns broadcast mainly on television have been carried out. However, the effectiveness of awareness campaigns, especially those related to the traffic and road safety sector, launched through social networks is a very little-researched topic. Thus, given the recent use of X (formally Twitter) as a transmitter of this type of campaigns, it is urgent to evaluate its effectiveness in providing information of interest for the development of campaigns with specific messages (Korda and Itani, 2013). The feedback could be especially relevant for experts, public health policy, and campaign developers.

## 1.1 Social networks as dissemination channels for public health campaigns

In the contemporary digital environment, social networks have emerged as a significant resource to promote health through targeted campaigns at a low economic cost (Jones, 2012). These channels possess a great capacity to reach and connect audiences globally. In addition, these platforms have the potential to target broad and diverse audiences in terms of demographics and geography. Thus, health campaigns can benefit from this diversity and reach people of different ages and cultures (Casado-Sanz et al., 2019).

There are several advantages that characterize the use of social networks in health campaigns. First, the features of “sharing”, “retweeting,” and, in short, interacting in any way with the original tweet encourage the viralization of its content, which can lead to greater visibility and dissemination of the message (Ramanathan et al., 2017). The active participation of users through likes, comments and shares, drives engagement and connection with the content. In addition, social media platforms offer highly specific segmentation options, allowing particular demographics and interest groups to be targeted precisely, provided that the communication strategy is designed with the characteristics of the target audience in mind (Dibb and Carrigan, 2013).

Studies have been conducted on the impact of health campaigns developed on social networks, pointing out the usefulness of these platforms in meeting individual and population health needs. Specifically, there have been positive results in campaigns on various issues such as obesity, the promotion of physical activity and smoking cessation (Portnoy et al., 2008). However, some research indicates that although the impact is positive, the changes in behavior are small compared to the campaigns disseminated through non-digital media (Webb et al., 2010). In the case of traffic and road safety campaigns broadcast on X (formally Twitter) or other social networks, no studies have been found in this regard. Therefore, the present study is a first approximation to the digital impact of a communication campaign of this type.

## 1.2 Impact of traffic campaigns in Spain on social networks

This research focuses on the analysis of the impact on X (formally Twitter) of the summer campaign issued by the General Directorate of Traffic in Spain in 2022. This advertisement has been selected because it presents several particularities. First, the official accounts of the DGT (@dgtes) as well as the Spanish Ministry of Interior (@interiorgob) on X (formally Twitter) have been broadcasting national traffic campaigns since 2018. However, the engagement of the ads on this social network had been very low. This trend changes drastically in the 2022 campaign with the slogan “To know it is to start to avoid it” (“Saberlo es empezar a evitarlo”) (Table 1).

These major differences raise two questions: (1) What elements make up this ad that have contributed to it going viral on X (formally Twitter), and (2) Does the campaign going viral mean that the message has been adequately conveyed to viewers?

## 1.3 Objectives of the study

In order to respond to these questions, the core aim of this study was to examine the digital presence generated by a campaign on the X (formally Twitter) platform through the analysis of key digital reach indicators, as follows: firstly, the virtual impact of the campaign will be identified in relation to quantitative aspects linked to views and interactions, as well as indicating the geographic locations where the campaign’s content has generated the greatest resonance. Secondly, qualitative analyses will be carried out to identify the content and audience sentiment in these interactions.

Complementarily, the discussion will synthesize the results, relating them to the findings obtained with the relevant literature on the impact of social media campaigns in order to interpret the results in the context of the campaign strategy and offer possible explanations for the patterns identified, as well as discuss the possible relationship between the impact or reach and the effectiveness of the spot in terms of its ability to induce behavioral changes in the audience.

TABLE 1 First official tweet of the campaigns.

Date	Campaign	Profile	Retweets/ citations	Likes	Replays	Interactions in Spain
2018	Dead or Alive ( <i>Vivo o muerto</i> )	@dgtes	111	106	7	100%
2019	Top Vacation ( <i>Top Vacacional</i> )	@dgtes	167	195	13	100%
2020	This country can't take any more deaths ( <i>Este país no puede soportar más muertes</i> )	@interiorgob	92	160	13	100%
2021	Don't spoil it ( <i>No lo estropees</i> )	@desdelamoncloa	31	46	2	100%
2022	To know it is to start to avoid it ( <i>Saberlo es empezar a evitarlo</i> )	@interiorgob	6,927	9,047	569	79.5%

Data as of June 30, 2022 at 10:18 a.m.

## 2 Methods

### 2.1 Campaign description

The campaign was launched on June 27, 2022 in the form of two pieces of advertisement. In both of them, a situation in which a pedestrian can be run over on an interurban road is developed, a subject that has not yet been dealt with in DGT campaigns. The star-system resource is used, whereby the protagonists of the ads are public figures, a young female singer and a grown-up actor, both acclaimed by the Spanish audience for their professional careers. Both feature different profiles so that a wide sector of the population identifies with them.

In both cases, the ad starts in a discursive way, placing the well-known faces as fatal victims of a surprising traffic accident, using high-impact and aggressive images. Thus, the public figure says, “*Last year, more than a hundred people were killed on Spanish roads, and many of them were in summer. Some for not wearing reflective elements, others for driver recklessness or others for crossing in inappropriate places. But really, we don't become aware unless it's your sister, your son... or a famous person*”. At that precise moment, the famous person is run over by a vehicle, causing his death.

Celebrities have been used for decades in road safety campaigns; however, they are usually used in a friendly and informative tone. The 2022 campaign is the first time that well-known people are seen suffering the direct consequences of a crash.

### 2.2 Data collection, coding and processing

The tweets were collected during the first 48 h after the launch of the campaign “To know it is to start to avoid it” (*Saberlo es empezar a evitarlo*), that is, from 11:00 am on June 27, 2022 until 11:00 am on June 29, 2022. For the quantitative analyses related to the impact and reach of the ads, the geotagged tweets that interacted with the two official tweets issued by the official profiles of the Ministry of the Interior and those that used the campaign hashtag were obtained. The analysis program “TalkWalker” was used to

extract the levels of engagement and reach of the campaign, as well as the overall impact of the primary Tweet.

Additionally, for the analysis of the sentiment generated by the campaign, tweets were collected through the key search terms corresponding to the two main characters of the ads, specifically searching their names and the tweets mentioning the “DGT” (Dirección General de Tráfico) were also included. The log included the content of the tweet, the tweet ID and the sentiment scores calculated by the tool used. The keyword search method helped to collect tweets related to the campaign that did not necessarily use the campaign hashtag, following the methodology of other previous studies (Harris et al., 2014; Sanders-Jackson et al., 2015; Chung, 2016).

### 2.3 Data analysis

In this study, we employed the Talkwalker social media analytics platform to examine in detail the impact and interaction generated by a specific campaign on social media. Through a comprehensive analysis, we investigated various dimensions of the campaign, including interactions, geographic impact, and sentiment analysis, among other analyses. In this sense, we measured and quantified the interactions generated by the campaign on social networks. This included tracking likes, retweets, replies and mentions on tweets related to the campaign. Through the metrics provided by the tool, the campaign's resonance was assessed in terms of its ability to capture the attention and engagement of the audience. The tool also allowed a comparison between the two ads that make up the campaign through metrics of reach, interactions and virality to evaluate the relative effectiveness of each ad in terms of its ability to generate audience engagement.

On the other hand, the geographic locations where the campaign generated the greatest impact were identified by tracking the geographic distribution of Tweet mentions, thus obtaining a detailed view of the regions where the campaign generated the greatest echo, both in Spain and in other countries around the world. In addition, to understand the general perception of the campaign, sentiment analysis was performed using key

TABLE 2 Table with the impact on X (formally Twitter) after the first 24 h following the publication of the tweet.

Campaign "To know it is to start to avoid it".	Profile	Retweets	Likes	Interactions in Spain	Total engagement	Total reach
"We have killed [young female singer]" ( <i>Hemos matado a [cantante joven]</i> )	@interiorgob	1,800	8,900	79.5%	12,900	2 M
"We have killed [grown-up actor]" ( <i>Hemos matado a [actor adulto]</i> )	@interiorgob	5	13	100%	21.6	1.2 M

The campaign's slogan directly mentions the real names of the protagonists of the spots.

terms associated with the campaign, such as the two public figures starring in the spots and the institution responsible for the design and dissemination of the campaign. The sentiment analysis functionality in Talkwalker allowed us to explore how key terms were being discussed in social networks to identify whether positive, negative or neutral sentiment predominated.

Incidentally, and complementary to the general sentiment, we wanted to identify patterns in the discourse generated in social networks. For this purpose, the content analysis tool "Iramuteq" (R Interface pour les Analyses Multidimensionnelles de Textes et de Questionnaires) was used. Thus, after collecting the tweets that directly mentioned the campaign, which included replies, retweets and interactions with the original tweets of the campaign, the data were prepared by eliminating links, special characters or any symbol that the tool could not analyze. Subsequently, the data was imported into the program. In this way, Word Cloud Generation was carried out to represent an overview of the most frequently used terms by the audience and provide a quick view of the dominant topics and keywords in the tweets interacting with the original. Additionally, a Similarity Analysis was performed, a multidimensional analysis technique to explore the relationships between categories and terms in the text corpus. This way, the relationships between the terms used in the tweets and the categories or discursive patterns they represent are identified more specifically.

## 2.4 Ethics

This study was approved by the Ethics Committee of the University Research Institute on Traffic and Road Safety (INTRAS) at the University of Valencia, certifying that the study design and protocols responded to the general ethical principles applicable to this type of research.

## 3 Results

### 3.1 Quantitative analysis of interactions

The data show that, although the traffic campaign consisted of two ads, the impact on X (formally Twitter) was particularly notable in one of them (Table 2). The spot starring by the young female singer has had a much higher presence in this social network, obtaining a higher number of interactions and multiplying by almost 600 points the engagement of the other ad that makes up the campaign.

Figure 1 shows the differences in impact in the first 48 h after the broadcast of each of the spots, representing the number of interactions in the form of the reach of the original tweet of the two analyzed ads. It can be seen graphically that the ad starring the actor has an almost minimal presence compared to the other spot.

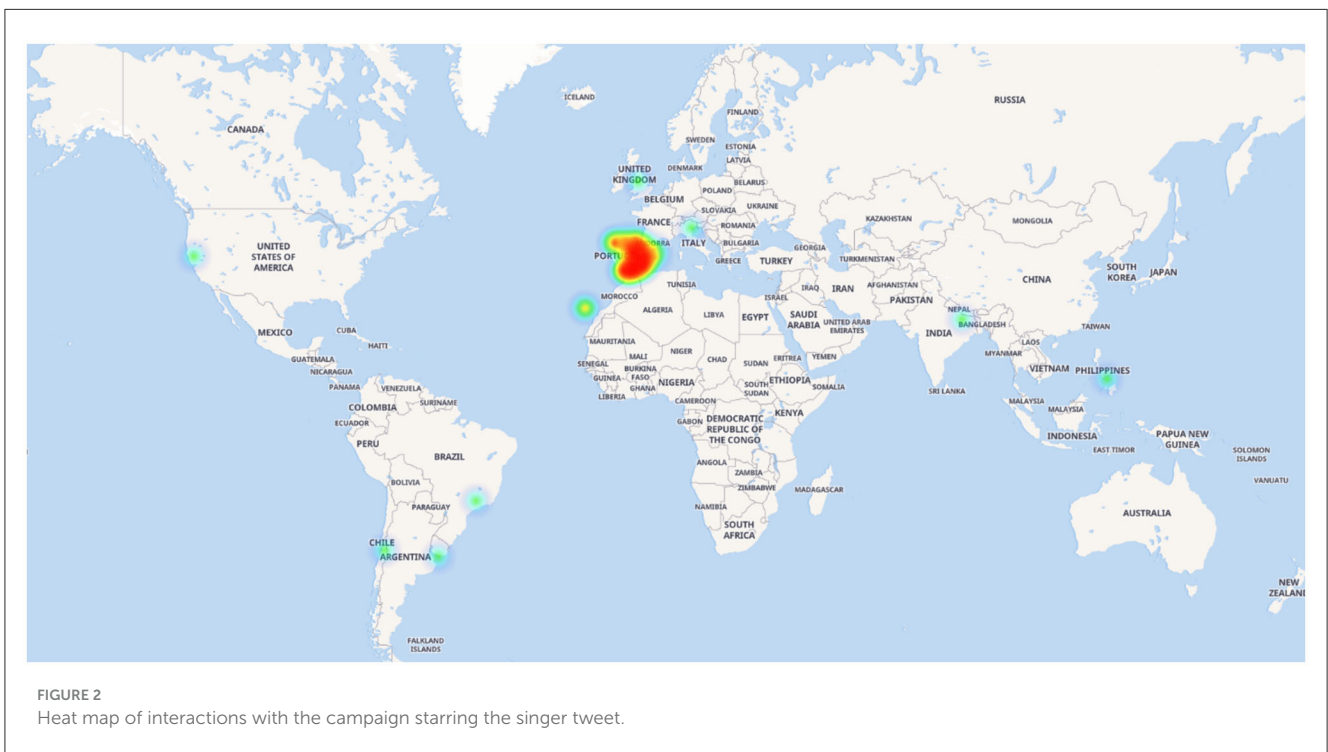
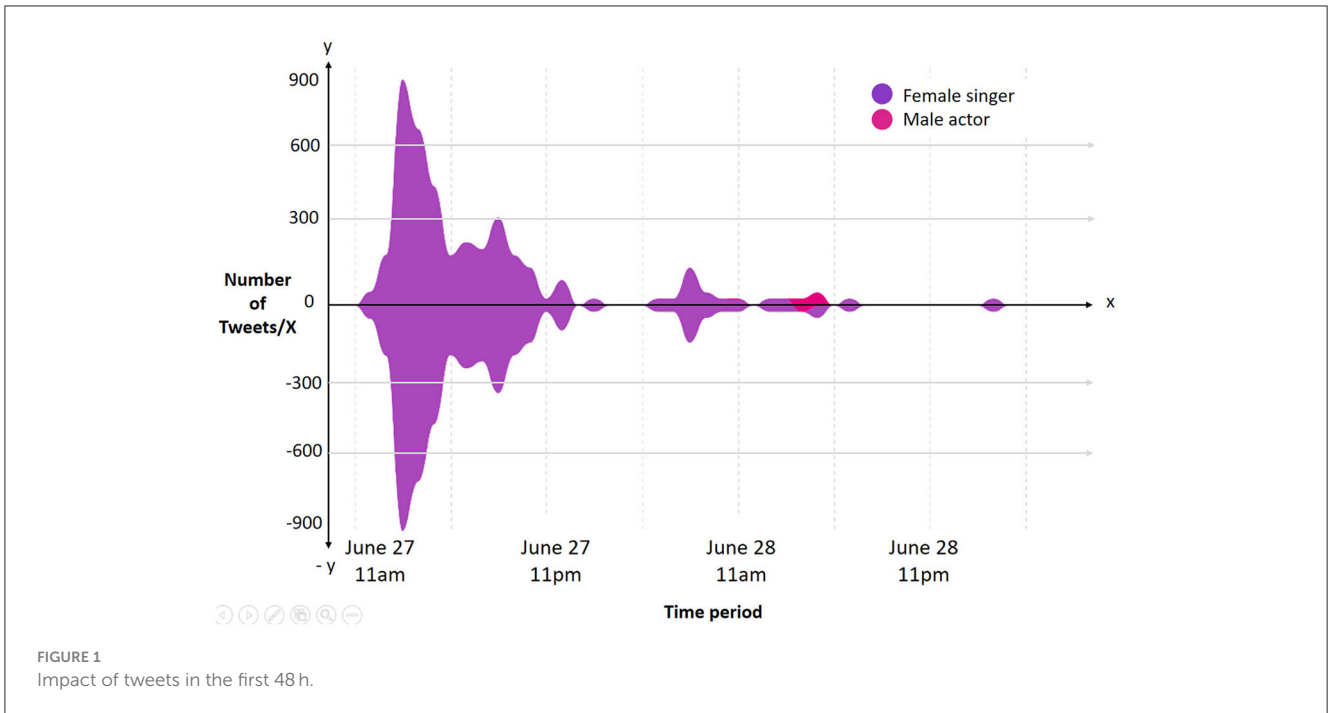
The viralization of the campaign has not been limited exclusively to Spain but has reached other countries such as the Philippines, United Kingdom, Italy, Chile, Argentina, Brazil and the United States (Figure 2). There have been differences between the two ads, with the one starring the singer being the only one that has generated interactions outside Spain (Table 2).

### 3.2 Qualitative analysis of interactions

The feelings aroused by three key terms in the 2022 traffic campaign have been analyzed. Thus, during the week of the campaign launch, the concept that generated the most interactions is "[young female singer's name]", with 2.8k positive tweets (20.7%), 2.1k negative (16.2%), and 8.4k not expressing any sentiment (63%). "DGT" (Dirección General de Tráfico) generates a total of 5.5k Tweets, showing mostly a feeling of indifference (4.4k Tweets, representing 80.3%), while "[grown-up actor's name]" is the term that causes the least interactions, with <500 Tweets referring to it, being 13.5% positive, 9.1% negative and 77.3% indifferent.

Figure 3 shows the evolution of the sentiment expressed by the tweets in each of the three concepts analyzed. Some dispersion is observed, especially in the terms "[young female singer's name]" and "DGT", however, during the first 24 h after the broadcast (from 11:00 h on June 27, 2022 to 11:00 h on June 28, 2022), the three concepts are maintained practically all the time, with a tendency to positive sentiments. After this period of time, the usual dispersion trend in these terms is produced again.

Subsequently, the most repeated terms have been analyzed in relation to the original tweet issued by the Ministry of the Interior. This process has been applied only to the campaign with the highest impact since the scarcity of interactions in the other spot does not allow for a detailed analysis of it. In this sense, two content analysis techniques have been performed to visually represent the terms associated with the campaign spot, depending on who the sender of the interaction was. Thus, on the one hand, the line of the speech broadcast by the official channels and sources is evaluated. On the other hand, the audience's general perception and opinion about the spot are analyzed. This differentiation allows to identify the potential differences in discourse tendencies, which can occur depending on the type of sender.



In this way, Figure 4 represents a word cloud with the concepts or tags issued by verified X (formally Twitter) users, taking into account that in the period analyzed it was not possible to pay to obtain verification, so all these users were official and had a recognized notoriety. Most of the users were identified with governmental or institutional accounts at local or regional levels and with accounts associated with different types of media such as press, radio, and television. As for the content, all the terms

associated with the ad, which appear as the most repeated, have a serious and informative tone, using descriptive words and concepts or hashtags included in the spot itself, such as “awareness” (*concienciación*), “hit and run” (*atropelladas*), “avoid” (*evitarlo*), “road” (*carretera*), or “persons” (*personas*).

Subsequently, a similarity analysis was performed with the Iramuteq program to identify the linguistic communities formed between the words and their relationships. In this case, no account

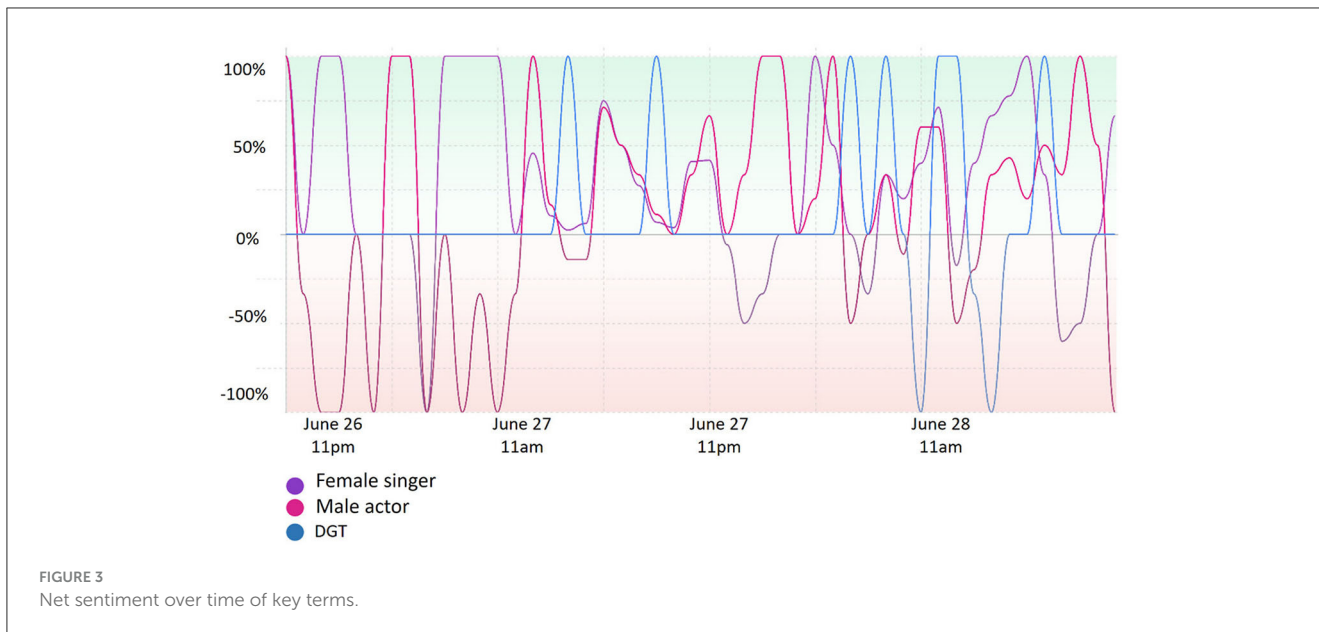


FIGURE 3 Net sentiment over time of key terms.



FIGURE 4 Terms linked to the campaign starring the singer Tweet from verified accounts.

has been excluded, including both unverified and verified users. Figure 5 represents the blocks of terms framed in the same discourse and the relationships in the trends or patterns of user responses. It is possible to observe a main branch represented by a community of words in which the central concepts of “[young female singer’s name]” and “Advertisement” (*Anuncio*) stand out. At this point, there are two major trends in the discourse, which, in turn, are divided into several communities of terms. Thus, the branches that link the central concepts with the blocks of words located to the left of the image represent a discourse related to the impact of the advertisement, its identification as an effective advertisement and the high awareness that it can cause. Thus, the orange-colored word community uses terms such as “See” (*Ver*), “Look” (*Mirar*), “Cross” (*Cruzar*), “Always” (*Siempre*) or “Raise awareness” (*Concienciar*), which describe the safe behavior that pedestrians should perform on interurban roads and which is being exposed in the spot. On the other hand, the community identified with light blue colors, presents terms such as “go” (*ir*), “shocking” (*impactante*), “think” (*pensar*), “victims” (*víctimas*) or “hit and run”

(*atropello*), being a speech focused on the strategy of the emotional impact of a scene in which a traffic accident is crudely visualized.

However, the branches that link to the word communities located to the right of the image present a very different meaning. More scattered blocks are represented among which terms such as “do” (*hacer*), “laugh” (*risa*), “joke” (*broma*), “meme”, “make fun” (*hacer gracia*), or even “hahaha” (*jajaja*) stand out. Therefore, the discourse maintained by an important part of the audience is related to the fact that the ad, far from shocking them, has had humorous connotations. In fact, the spot reminds many people of scenes from comedy movies, having included specific references to some of them. Among some repeated concepts is a scene from the film “Mean Girls” (*Chicas Malas*) and the Spanish comedy series “Paquita Salas”, both represented in the lower part of Figure 5. In addition, if we pay attention to specific phrases emitted by users, ironic comments such as “I hope she survives” (*Espero que sobreviva*), “Do you know if they return the ticket for her concert after this?” (*¿Sabéis si devuelven la entrada para su concierto después de esto?*), “She didn’t sing so bad to do this to her” (*No cantaba tan*



## 4.1 Is viral a synonym for effective?

The analyzed campaign has achieved a high digital impact compared to ads that, in previous years, had been disseminated through X (formally Twitter). However, at this time, it is not possible to know for sure the real impact on the attitude and behavior of users since no evaluations of the effectiveness of such a campaign have been carried out (Dunlop et al., 2016). However, the trend observed is that it will be a well-remembered spot. In fact, after a year of its broadcast, the personal publications of the person starring in the ad comments referring to said spot. Therefore, based on the data, the objective of achieving a campaign that has captured the viewers' attention has been achieved, and apparently, the spot will be remembered in the long term. This is an important factor in evaluating the effectiveness of a spot, being the first step to consolidating its message (Alonso et al., 2021; Charlesworth et al., 2022). If the ad fails to stand out from the rest and capture the attention of the audience, it will not be possible to convey the message adequately. In this respect, Lee et al. (2021) point out that the public's inclination to adopt the behavior shown on the spot may increase through positive information in both social networks and traditional media.

However, the fact that a traffic or public health campaign is viral does not automatically guarantee that the message has been fully understood or captured by the viewers (Faus et al., 2022). In this sense, a viral campaign only means that it has spread rapidly through social networks and generated a large amount of attention and engagement in a short period of time (Niederdeppe et al., 2011). This high level of visibility and exposure does not always imply that the message has been understood in its entirety or in the desired manner (Gibson et al., 2017). Therefore, in the case of the analyzed campaign, there is some uncertainty about the degree to which the message will be remembered; the recall of the slogan or the informative content may be low, especially for people who accessed the spot through social networks, being feasible that the same spot arouses very different feelings in the audience that watches it on television compared to the one that accessed it through X (formally Twitter).

But what are the reasons that make us think the analyzed ad will be ineffective for behavioral change despite its high digital impact? On the one hand, there may have been a massive but superficial reach, causing high numbers of interactions both in Spain and in other countries, but without there being an analysis or understanding of many of the people who shared such content (Veale et al., 2015; Kapitan and Silvera, 2016)—an aspect related to the limited attention paid to content in social networks. Thus, users of this medium tend to receive an excess of information that causes a decrease in sustained attention, and therefore, it is likely that they do not spend the necessary time to delve into the full understanding of the message (Hudson et al., 2016; Valero-Mora et al., 2021).

In this sense, another relevant factor for the viralization of the campaign is the ability to provoke strong emotions, such as shock, surprise, laughter, shock or outrage (Taecharungroj and Nueangjamnong, 2014). In fact, Stephens et al. (2016) point out that social networks are communication channels that users use to express positive and negative feelings, such as rage or anger as a reaction to actual situations or the content they view. These rapid and emotional reactions can lead people to share the content

without necessarily understanding all the nuances of the message. Studies on the impact of campaigns for other health issues suggest that shocking and humorous messages generated the greatest impressions and engagement, but that information-based messages had a greater ability to generate potential changes in viewer attitudes (Gough et al., 2017).

Thus, if we look at the content of the interactions with the original tweet, we can see that most of the audience reacted ironically and sarcastically, creating memes and not taking the content seriously, so apparently, the important background of the ad was not understood. However, there is indeed a part of the discourse in which the emotional impact of the campaign is valued, being valued as effective by another sector of users. This phenomenon may be due to the variable interpretation of the content depending on the previous experience of each person or their sociodemographic characteristics (Herrera-Peco et al., 2021). Although no specific analysis has been conducted on these variables, scientific evidence indicates that age may influence the interpretation of the advertisement (Catalán-Matamoros, 2011). Younger people, who are those who generally use social networks, may react to the spot more superficially, more so considering the profile of the person who stars in it, with a profile with characteristics closer to this sector of the audience (Paul and Dredze, 2011; Coombes et al., 2013). In fact, the ad starring the actor, with a more adult profile, despite being very similar in content and message, has had a much lower reach in social networks. Furthermore, the gender of the protagonist of the spot may also have had an influence. Thus, various studies affirm that in audiovisual pieces such as films or advertisements, women catch the attention of more spectators, especially if they are involved in risky situations (Clover, 1993), just as it occurs in the analyzed spot.

Therefore, the complete and accurate understanding of the message is not necessarily related to its virality, although it is important to reach a mass audience (Glowacki et al., 2021). Therefore, entities responsible for the design of traffic and road safety campaigns, as well as other social and public health campaigns, should consider strategies that encourage reflection analysis and generate meaningful interaction with the content of the spot (Murthy et al., 2021). Achieving a middle ground between potentially massive content and an awareness-raising message should be the objective in the design of the spots.

## 4.2 Benefits of humor and memes as transmitters of health behaviors in social networks

The purpose of the analyzed campaign was not to generate a laughing response from the audience, which is evident in the treatment given to the spot by the press and the entities responsible for its diffusion. In this sense, the result of the campaign has taken on a humorous nuance without this being the senders of the spot intention. However, the humor as a strategy to transmit information is not to be underestimated. In fact, the General Directorate of Traffic has sometimes used humor as a communication strategy, although not always with the same nuances. Some campaigns use metaphors, animations and



cinematographic references with simple humor. However, sarcasm or black humor has also been used as a strategy to generate reflection in viewers (Ojeda et al., 2015; Faus et al., 2023a).

Research on the effectiveness of humor for social issues presents variable results. On the one hand, there are studies that point out that humor can hinder the comprehension of spots, especially if they address serious topics and/or messages (Weinberger and Gulas, 1992; Yoon and Tinkham, 2013). On the contrary, other research highlights the role of surprise as a key factor in capturing the attention of the receiver, as well as for the comprehension of images and messages, contributing to the effectiveness of the advertisement (Alden et al., 2000). In addition, the importance of choosing the right humorous resource is also highlighted since the most effective ones were considered to be “absurdity” and “comparisons” and/or “exaggerations”. The reason was that they were easier for the audience to understand compared to satire and irony, which could distort the decoding or interpretation of the message (Chan, 2011).

In this sense, the research described above is mostly on campaigns broadcast through traditional communication channels (above the line). However, in social networks, the use of humor can be even more effective because it is a technique that potentially increases the reach of the message by reaching a wide and diverse audience (Kostygina et al., 2020). In any case, effectively communicating a serious message through viral media can be challenging, as humor and levity can sometimes detract from the seriousness of the content, being difficult to find the balance between “entertainment” and effective transmission of serious content (Fraustino and Ma, 2015).

Additionally, users themselves can create and disseminate memes linked to the campaign that increase campaign interactions. Memes are humorous or ironic images, videos or texts that spread rapidly online (Ling et al., 2021). Thus, humor and memes can act as transmitters of health behaviors. In fact, some research has been conducted on the effect of memes in relation to the health crisis generated by COVID-19, identifying that understanding memes can be useful in designing shareable vaccination promotions, debunking myths and monitoring the acceptance of certain public health measures in social networks (Githinji and Omwoha, 2021; Sleight et al., 2021; Naseem et al., 2023).

However, it is important to recognize that their effectiveness may vary and depend on multiple and heterogeneous factors. On the one hand, in the case of memes generated by institutions responsible for traffic and road safety or other social problems, control of the content can be achieved by offering simple, concise and direct ideas (Msugheter, 2020). This can be beneficial to convey information in a clear and easy-to-understand way. Thus, if designed effectively, adapting to the sociodemographic and cultural characteristics of the audience, they can attract people's attention and encourage them to share them with their networks (Gurman et al., 2022). However, once the ad or meme is launched, interactions will start to be generated, including new memes created by users, which can no longer be controlled. Therefore, errors or distortions in the interpretation of the initial message may occur, increasing the risk of trivialization and decreasing the credibility of the content (Shomova, 2020).

In the present content analysis research of the campaign broadcast in Spain, a superficial discourse based on the audience's perception of the design and execution of the spot is identified, especially in the scene of the impact with the vehicle. Many users find similarities between this image and the one depicted in comedy movies, so it does not produce an emotional impact linked to fear. Still, on the contrary, they perceive it as funny, and so they express it on social networks. The profile of the person chosen also contributes to this perception, not being a person identified with a serious tone or image by the audience. In this sense, it is especially important to achieve the understanding and depth of the message that the person or persons starring in the campaign have values and image in line with the tone of the message to be conveyed to the audience (Faus et al., 2021).

For memes to be effective in producing changes in the attitudes and behaviors of users, it is necessary that people not only share them but also understand the message and adopt behaviors based on it, which can be favored by including key contextual elements. Thus, memes or viral messages that are emotionally resonant, informative and motivational have the potential to prompt people to take action, being powerful tools to convey health and behavioral messages, but they must be designed and used with care (Headley et al., 2022; Wasike, 2022; Faus et al., 2023b). The saturation of information on social networks requires campaigns to be exceptionally creative and engaging to stand out among the constant content stream. The choice of tone and communication style is essential, as health content should respectfully address issues and avoid trivializing this content (Mendoza-Herrera et al., 2020). Thus, delivering a clear and accurate message, collaborating with health professionals, disseminating reliable information, and having a thorough understanding of the target audience are factors that can increase the effectiveness of memes in promoting positive health behaviors. In addition, evidence points to the importance of campaign strategies not relying exclusively on social networks, but integrating and complementing them with other media and approaches to ensure a comprehensive and effective strategy (Santiago and Castelo, 2020).

In summary, virality alone is important but not enough; a strategic and creative approach is needed to maximize its benefits, in addition to periodic measurements that analyze the discourse generated in social networks to adapt the content if necessary (Pratt et al., 2010).

### 4.3 Limitations of the study

In the analysis of a traffic and road safety campaign through the evaluation of digital interactions, several limitations arise that should be mentioned. On the one hand, user-generated images, videos, and memes were not included in recording the content of the analyzed tweets. Since these visual components can convey messages powerfully and effectively, their omission could result in an incomplete understanding of the content and its impact (Hargittai, 2020). To minimize this limitation, an overview of this multimedia content has been provided to supplement information that has not been processed for content analysis that identifies discourse trends.

Moreover, although the tweets have been processed by a tool that analyzes user sentiment in relation to certain terms, there may be biases that limit the interpretation of these results (Li and Meesad, 2016). Digital interactions lack the emotional and facial cues in in-person communication, making it difficult to accurately interpret the emotions behind comments.

In addition, some research suggests that the interactions and content generated by the users can potentially be different depending on their region of residence (Sunitha et al., 2022). However, despite the fact that the evaluated campaign has had a presence in more than ten countries, in this case, these differences have not been possible to analyze because the impact proportions were too unequal, representing a residual percentage in all the regions in which it has generated interactions except for Spain, given that it is a campaign mainly aimed at citizens from this country.

Finally, although the discussion has presented possible repercussions of the analyzed campaign on audience behavior, it should be noted that the analysis of digital interactions does not necessarily reflect behavioral change in real life (Matz et al., 2017). Interactions may indicate attitudes and reactions but do not guarantee a direct translation into concrete actions in terms of road safety. Furthermore, multiple external factors influencing the results can complicate establishing strong causal relationships between online interactions and real-life behavioral changes.

## 5 Conclusions

In this study, there was carried out a comprehensive analysis of the traffic and road safety campaign broadcast in Spain in 2022, focusing on its digital impact through the evaluation of online interactions. The results reflect a high level of reach and visibility in the digital environment, indicating that the campaign has managed to go viral and capture the attention of a wide audience on social media platforms.

However, analysis of the content of the tweets reveals a nuanced perspective. Most interactions were characterized by a humorous interpretation of the ad. This trend suggests that while the content may have generated interest and engagement, it has also been received with a light and superficial tone by the audience. This finding could raise questions about the effectiveness of the message in conveying the seriousness of the topic and generating a substantial impact on road safety attitudes and behaviors.

Ultimately, it should be kept in mind that the actual mid- and long-term effectiveness of the campaign in promoting safe traffic behaviors and improving attitudes can only be determined through further, more comprehensive evaluations. Digital analytics can provide an initial snapshot of impact in terms of visibility and reach but cannot provide a complete assessment of behavioral change. It is, therefore, recommended that longitudinal evaluations be developed to measure the actual effect over time. Such future research is critical to determine the actual effectiveness of the campaign in promoting road safety and to guide more effective future communication strategies.

## Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## Ethics statement

This study was approved by the Ethics Committee of the University Research Institute on Traffic and Road Safety (INTRAS) at the University of Valencia, certifying that the study design and protocols responded to the general ethical principles applicable to this type of research.

## Author contributions

MF: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing—original draft, Writing—review & editing. FA: Conceptualization, Investigation, Supervision, Writing—review & editing. CF: Investigation, Supervision, Writing—review & editing. SU: Data curation, Investigation, Writing—review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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