

VERTICAL SCIENCE

New narratives in video and social media

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The presentation of science on social media has taken many forms over the years, from monologues and animations to live experiments. These new narratives are characterised by the use of everyday devices (generally portable devices such as mobile phones, laptops, or tablets) to leverage the potential of the digital environment (filters, stickers, GIFs, and animations, among others). The standardised design of current mobile phones, which usually have large touchscreen displays, has pushed the use of vertical formats to the forefront. Verticality has made it possible to change content not only from an aesthetic point of view, but also from a narrative one. Thus, this present article reviews the main changes resulting from this shift in terms of the way science is brought closer to audiences.

Keywords: dissemination, new narratives, science, online videos, social networks, vertical formats.

■ INTRODUCTION

In the field of science communication, it is widely recommended that stories should be told rather than merely reporting data and facts. Among other things, stories have been shown to motivate people to change their behaviour (Byerly et al., 2021). A story is a narrative with simple, resonant characters and plots that uses storytelling skills and elements of risk to entertain and persuade (Gabriel, 2000). All humans are storytellers: in fact, storytelling is considered part of a type of linguistic intelligence that is «the broadest and most widespread in the human species» (González, 2017). The appeal of stories lies in the fact that they allow users to identify with characters or situations that they have not experienced first-hand.

In their overview of the typologies and characteristics of popular science web videos,

«The appeal of stories lies in the fact that they allow users to identify with characters or situations that they have not experienced first-hand»

Morcillo et al. (2016) reviewed 200 videos and found that these short pieces encompassed a wide variety of genres and sub-genres. The content was entertaining and had a clear explanatory and dramaturgical structure. Some of these novel sub-genres were monologues, question and answer sessions, live drawing videos, live writing sessions, edited talks, and live experiments. Although Morcillo et al. (2016) found that online productions had appropriated certain conventions of traditional media, it was also evident that their own narratives considered, among other things, the technological devices on which the audiovisual materials were consumed. Thus, it appears that technology has set the standards since the digitalisation boom and continues to do so today.

Interestingly, online video technologies have led to new representations and experiences of time. Genres

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such as micro-fiction, web series, lip dubs, film teasers, unboxing videos, remixes, fandom videos, lessons, and tutorials, among others, have led to a rethink of hegemonic audiovisual formats and have created a circle of influence between offline and online content (Sora, 2016). For example, almost two decades ago content trailers changed in length from 30-second TV spots to a short version of a film lasting up to four minutes.

These changes have not gone unnoticed by social media companies who have tried to give their users the ability to express themselves and tell stories. As mentioned earlier, this is driven by the logic of the use of devices such as mobile phones. For example, users are encouraged to generate content through memories or Stories, which has now made the narration of everyday experiences a common practice. Stories are usually short and often deal with current situations but can also be about past or future events. The first to introduce them was Snapchat in 2014, followed by Instagram and TikTok in 2016, Facebook and WhatsApp (called Statuses on these platforms) in 2017, Weibo in 2018, and X (formerly Twitter) with its Fleets in 2020, although the latter was discontinued a year later.

This democratisation of production, in which changes or innovations in science storytelling are thereby related to temporality (and thus, to technology), highlights the incorporation of entertainment elements such as stickers, extra-diegetic sound, effects, filters, and animations, among others.

To ensure continuous production, platforms are also making content ephemeral – Stories are deleted or archived within 24 hours – and user curation features such as the «Like», «Comment», and «Share» buttons that determine each Story's reach have also been introduced.

Below is a list of the current ways science can be disseminated in novel ways, especially focusing on online video, given its obvious impact on the digital environment (49.7% of internet users aged 16–64 watch online videos, films, or TV shows) and social networking sites given that 59.4% of the world's population are active on them (Digital Global Overview Report, 2023).

■ VERTICAL VIDEO

Many stories on mobile devices are in a vertical format to avoid users having to rotate their screens. The verticalisation of our gaze was first driven by the use of touchscreen phones. Indeed, Gómez-Muñoz (2022) argues that since 2007, smartphone design has moved away from horizontality, especially for generations



From Dominic Hart / NASA Image and Video Library

Touchscreen smartphones have moved away from the horizontal. Reality is now vertical, and when creating video content, it is necessary to adapt to this format, taking into account which spaces and images work best. Above is an example of applying the vertical format typical of social networks such as TikTok to an image of a NASA outreach activity in the Mojave Desert in Southern California.



@malikandmiles / TikTok

TikTok is one of the social networks promoting vertical videos. There are also accounts dedicated to the dissemination and communication of science. This is the case of @malikandmiles, the channel of brothers Malik and Miles George, PhD students at MIT, focused on STEAM content. The videos are educational, but they always try to make it fun.

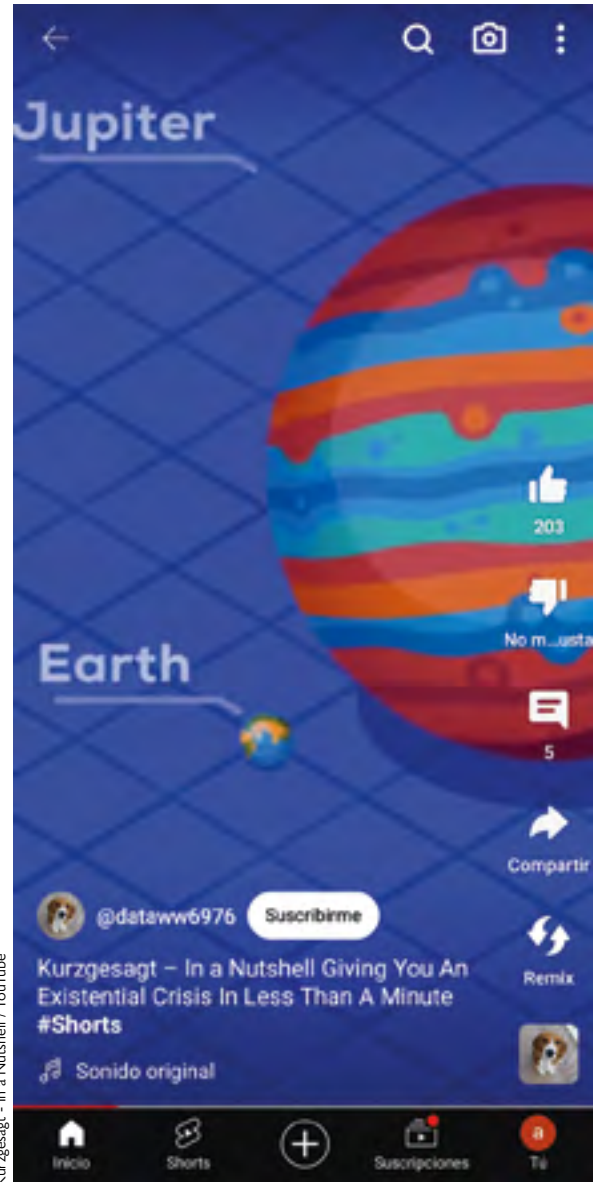
born after this innovation in phone design: in other words, after the arrival of the standardised iPhone touchscreens and screen proportions. For recent generations, reality is not only flat – because it is increasingly consumed through screens – but also vertical, notes Gómez-Muñoz (2022).

Of note, verticality has made it possible to change content both from an aesthetic and a narrative perspective. In this sense, Mateos and Herrera (2021) argue that format influences storytelling: creators need to know how to use the space above and below in videos and identify which images work best vertically.

Of all the social networks offering vertical video formats, TikTok is undoubtedly the fastest growing and is driven by Generation Z (Yang et al., 2019). During the COVID-19 lockdowns, the application added «Coronavirus», «Preventive measures», and «Questions and answers» buttons to its menu to provide quick access to information published by non-governmental organisations and health authorities such as the World Health Organization, International Organization for Migration, and World Economic Forum (Sidorenko-Bautista et al., 2020). Thus, TikTok's penetration went from 13 % in 2020 to 29 % in 2021 and 36 % in 2022 (IAB Spain, 2022). The constant challenges proposed by the user community with hashtags such as #yomequedoencasa ('I'll stay at home', 2.4 billion views) or #manosseguras ('safe hands', more than 4.2 billion views), to name just a few of the most popular ones, made TikTok the ideal social network for people who like hashtags and doing challenges (Sidorenko-Bautista et al., 2020).

Popular vertical videos on TikTok are short and entertaining. They capture the attention of viewers, who have fun and then share them with others. Among the resources used to help boost these videos are extradiegetic sound, music, and humour. For example, the twins Malik and Miles George, PhD students at the Massachusetts Institute of Technology, use these resources on their TikTok channel @malikandmiles, where they discuss STEAM topics. Incorporating sound and music into the post-production adds a humorous component to stories, thereby also making the educational message entertaining.

Instagram has two vertical video options (although they are also used for photos): Reels and Stories, both of which are quite similar. Both allow users to use filters, stickers, and music, etc. The difference is the time limit allowed for each one. A Reel can last between 15 and 90 seconds, while Stories can last a maximum of 15 seconds. In addition, unlike Stories, Reels do not automatically disappear after 24 hours.



Kurzgesagt - In a Nutshell / YouTube

Vertical formats have changed the logic of animation, which tended to be presented in two-dimensional panoramic or horizontal planes, similar to our field of vision. Even on platforms such as YouTube, where horizontal formats predominate, there are vertical videos, such as this example from Kurzgesagt – In a Nutshell, which compares the size of the Earth to other planets and stars.

«Creators need to know how to use the space above and below in videos and identify which images work best vertically»

Instagram has profiles from institutions including NASA – which has published vertical, fragmented, short, and dynamic videos, but also includes a link to its full content – and media outlets such as National Geographic, which includes videos with guest experts giving their opinions on topics as well as providing short animations.

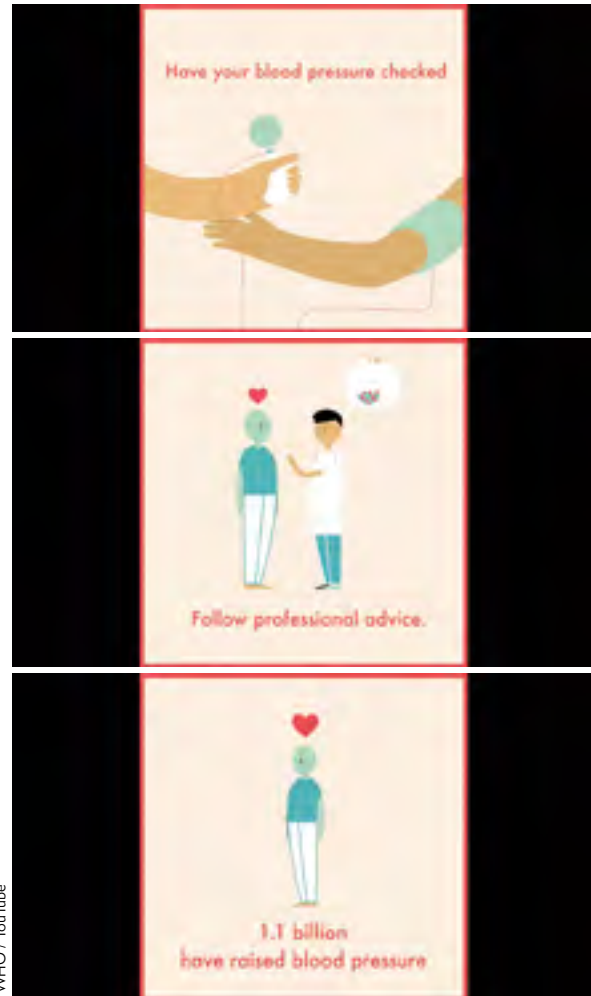
Facebook and YouTube are among the most popular networks that use vertical formats. The former offers the possibility of live broadcasting, while the latter allows users to post videos lasting up to 60 seconds in its Shorts section. The YouTube platform also offers creators a library of audio clips and songs to accompany their videos. In contrast to the video section, the presenter or influencer figure is not as necessary in Shorts, and more emphasis is placed on experimentation in this type of content.

«**Verticality has made it possible to change content both from an aesthetic and a narrative perspective**»

■ 2D ANIMATION

For Mateos and Herrera (2021), vertical formats have also changed the logic of moving images. Traditionally, images have been presented in two-dimensional panoramic or horizontal planes to better adapt to our field of vision. These authors point out that in the vertical format, figures and backgrounds are highlighted in the frame and that objects cannot be seen in their entirety (the phenomenon of fragmentation). These differences can be seen in the case of YouTube: although the horizontal format predominates on the platform, it also has vertical videos. For example, the channel Kurzgesagt – In a Nutshell uses colourful animation and music to explain complex scientific topics in a way that is accessible to the general public. In one of its vertical videos, *Kurzgesagt – In a Nutshell Giving You An Existential Crisis In Less Than A Minute #Shorts*, they compare the size of the Earth to other planets and stars in the universe.

Other channels have opted to use square formats for vertical videos. For example, The World Health Organization's YouTube channel features animations in which the centre of the scene is the most important feature, as in the Short *WHO: Hypertension: Act now!* It is worth noting that using the centre of the screen has its advantages: it avoids distraction from tags and other resources at the bottom of the screen.



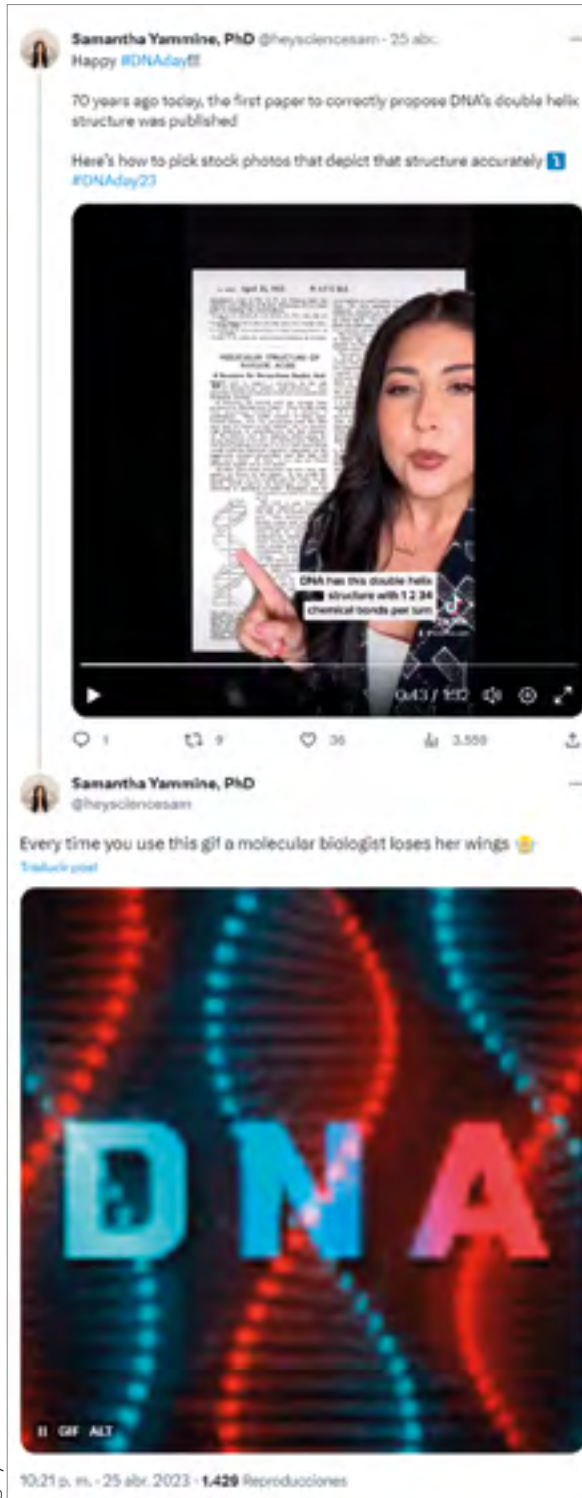
WHO / YouTube

Some vertical videos opt for a square format, with the centre of the scene attracting the most attention. This is the case with the hypertension piece on the World Health Organisation's YouTube channel.

■ STORIES IN REAL TIME

Capturing users' everyday experiences has also been used to bring science closer to a wider audience. In cultural spaces, for example, the use of social media in the context of museum visits has increased. Thus, in line with technological developments and visitor expectations, museums have focused on engaging the public in their collections, exhibitions, and programmes by selecting unusual details and images and displaying them as a form of social commentary.

Villaespesa and Wowkowych (2020) analysed the Stories uploaded to Snapchat and Instagram by visitors to the Brooklyn Museum and found that visually engaging signage and objects on display during its tours helped visitors create personal online narratives. The building's facade is often used to



@heysciencesam / X

Threads on the social network X (formerly known as Twitter) are also designed to be vertical. Threads include vertical videos, which are usually short and supplemented with links, images, gifs and polls. The image shows an example of a thread from the @heysciencesam account, run by scientist Samantha Yammine.

provide context at the beginning of the Story; the wall at the entrance to the exhibition, museum tickets, and gallery posters are other common opening elements. Because Stories disappear after 24 hours, editing is minimal and real-time interaction with the objects and museum environment is accompanied by live conversations that encourage viewers to come to the museum.

With these videos, visitors become curators of what interests them or piques their curiosity. They then share the museum experience with others who may then be motivated by what they see. Of note, both Snapchat and Instagram Stories can be edited before being published, with options including the addition of video effects, tags, drawings, text, stickers, GIFs, emojis, filters, and more.

With the constant evolution of social networks and the tools available to create content, there is a trend towards the creation of interactive scientific content including games and virtual experiences that allow users to learn about scientific topics while having fun and/or collaborating with each other. An example of this is the @thebrainninjas Instagram account which uses interactive stories to teach audiences about topics related to the human brain. Users can interact with the content to learn about different parts of the brain and how they work, and the account provides, for example, tips on how to improve one's memory and allows comments on user experiences.

«Threads on X (formerly Twitter) are a popular way of discussing science in detail from the logic of verticality»

■ X THREADS

Threads became popular on Twitter in 2017 (Guallar & Traver, 2020), before the microblogging network became X. Threads are a popular way of discussing science in detail from the logic of verticality. Science experts, teachers, and users share information, debate scientific issues, and discuss new research, and in increasing numbers, are sharing vertical videos complemented by links to studies, images, GIFs, and polls. The videos are usually short, lasting less than two minutes, and are generally recorded on a mobile phone. Their narration is fragmented and accompanied by text to help make sense of the videos.

Among the accounts using this resource is that of scientist Samantha Yammine (@heysciencesam), who uses the platform to share information about

neuroscience and cell biology in an accessible way. She uses her own videos, imported from TikTok, to present complex scientific topics in an easy-to-understand format.

To encourage user participation, X offers the option of using emojis. In another example, the account Enseñame de Ciencia ('Teach me about Science', @Ensedeciencia) uses Threads to encourage users to comment and many of the replies use the same tools to express their feelings or impressions about the scientific topic presented.

■ LIVE BROADCASTS

Verticalisation does not necessarily mean that horizontal formats have no impact on audiences. In fact, they are still the most popular format in general, but vertical formats are used more by young people and on certain social networks. Successful examples of horizontal formats are live broadcasts, where the figure of the streamer is prominent. The dynamics are similar to television formats such as news or talk shows, with the difference that live broadcasts, as the name suggests, are always live, although they can also be watched asynchronously. Their main characteristics are spontaneity, informality, and a colloquial use of language, generally in line with the style of the streamer and without the time constraints of Instagram Stories or of other social networks.

In turn, platforms such as Twitch, Facebook, and YouTube allow users to interact in real time via chat. The shows often feature guests, similar to traditional television channels, although there are disparities. Apart from differences in recording studios or locations, both of which are more informal and improvised in live broadcasts, the latter tend to be shot with a single, static camera, and the guests are sometimes not present in person, but rather use a format known as screen sharing. Both live broadcasts with guests and videos when the streamer is alone tend to be dialogue-based. The latter have the same intention and style because the streamers interact with their audience through the questions and comments they receive in the chat.

For example, on the Twitch channel SherezadeMR (<https://www.twitch.tv/sherezademr>), there is a space called *Just Sciencing*, in which researchers from different scientific fields talk about their research and



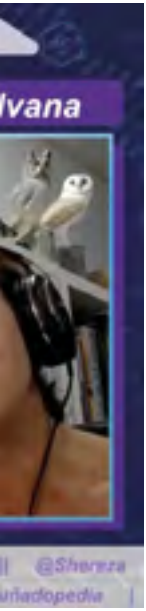
Verticalisation does not necessarily mean that horizontal formats have no impact on the audience. This is the case with live broadcasts on YouTube or Twitch, where streamers often have guests on a shared screen. An example of this can be found on SherezadeMR's Twitch channel. In their *Just Sciencing* space, researchers and scientists from different fields explain issues related to their research and discipline.

projects, etc. These streamers use rhetorical figures such as anecdotes to interest their audience.

■ THE CHALLENGE: ASSESSING THE EFFECTS

As can be seen, online scientific videos differ depending on the use of current digital technologies, in particular the verticality of smartphone screens and the use of digital networks. On the one hand, these have adapted to smartphones (where most digital content circulates) and on the other, they facilitate formats and provide functionalities such as the possibility of live streaming, Stories, and Threads, etc. This has become evident not only in the field of science communication, but also more generally. The democratisation of production has led users to rethink their everyday consumption practices in order to generate content according to their own preferences and the availability of resources. This is why virtual, augmented, or mixed reality content, to name just a few examples, is not the norm.

Vertical formats are booming, especially with the development of platforms that encourage endless scrolling, but it is worth assessing the long-term impact of such content and whether it has the same effect on memory and behaviour as character and plot-



SherezadeMR / Twitch



@EnsedeCiencia / X

Emojis drive user engagement, and motivate users to comment. In the image, some examples from the Enséñame de Ciencia (@EnsedeCiencia) account.

«Horizontal formats are still the most popular format, but vertical formats are used more by young people and on certain social networks»

driven stories. Indeed, infinite scrolling means that many users do not feel motivated to click on links to go deeper into the content. Indeed, Aza Raskin herself, who designed the feature in 2006, admitted that it does not allow users to process what they see (cited in Anderson, 2018).

The push for verticality responds mainly to the use of mobile phones, not to the need to approach science in a way that engages audiences. As set out here, humour or fun is almost always used in these formats to approach scientific issues. However, if the use of these resources is not balanced, the function of this content ends up being to entertain and to oversimplify science and its methods, rather than to democratise knowledge or make it more accessible. 🗑️

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