



What the Tech Giants don't want you to know

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Chapter 1

Executive summary

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The tech giants' retention mechanisms

INFLUENCE WITHOUT DEMOCRATIC OVERSIGHT

Digital services are becoming increasingly prevalent in our daily lives, with tech giants wielding significant power and influence over our private lives. So much so that their business models are becoming a fundamental aspect of everyday life for both adults and children. This development has taken place without much oversight, and children and adolescents are constantly exposed to content designed to hold their attention. More and more studies indicate that this exposure has a harmful effect on children and adolescents. This was most recently highlighted in the Consumer and Competition Authority's report, *Young Consumers and Social Media* which, among other things, examines the consequences of retention and dependence on users.

This study highlights the power and influence of tech giants, and provides new insights into retention mechanisms, behaviour patterns and content. This study helps promote meaningful and democratic regulation of social media. Regulation has become a matter of public concern at a time when being able to equip younger generations for lives in which the physical and digital worlds are intertwined has become economically and culturally advantageous.

NEW METHODS OFFER NEW INSIGHTS

Tech giants are notoriously secretive and do not voluntarily share data that could teach us more about retention and harmful content. In this study, we have therefore developed a new tool where young people can voluntarily and anonymously donate their data to the project. They can only do this because of their GDPR-protected rights, which state that everyone has the right to receive the data collected about them.

This marked the start of an extensive data donation, with 219 people donating over 17 million data points, including links to content they have viewed on TikTok, YouTube and, to a lesser extent, Instagram. This has allowed us to examine the systematic nature of the interaction between actual behaviour, retention mechanisms, and harmful content.

Over the next 80 pages, we will present the extensive donated data and share insights that, in many cases, support a lot of popular assumptions, but which we can now demonstrate with concrete data.

We have summarized the most crucial results into five main insights.

1

Different forms of retention. The young people in the study spend an average of 90 minutes on TikTok and 70 minutes on YouTube every day. These numbers cover a range of variations, and if we drill down, we can see that 10% of the most committed young people spend 2 hours and 40 minutes on TikTok, watching an average of 895 videos per day. We also find three consistent categories: 1) Those who frequently and persistently check their social media, 2) Those who are online fewer times during the day, but who frequently scroll for longer periods of time when they are online, 3) Those who are online more sporadically and with shorter sessions.

2

Go short or go home! The analysis shows how design, formats and infrastructure affect total time spent on social media and user retention. One of the major revolutions in terms of formats is TikTok's ultra-short video format, i.e. *shorts*, which has encouraged YouTube, Instagram, Facebook, Snapchat, Reddit, X and even DR to produce similar short formats. We can see that, on YouTube, there is a direct correlation between the number of *shorts* that users see and the time they spend on the platform. See chapter 3.

3

The value of retention. In the same way tech giants are secretive about data sharing, their earnings generated from users' time spent on the platforms are also a well-kept secret. We estimate that TikTok has earned DKK 482 to DKK 1,020 per year per data donor in this study. These calculations are based on the number of advertisements viewed, which account for 18% of the total number of videos in our TikTok dataset. See chapter 4.

4

Harmful content is live in the feed – with a measurable cumulative effect. Based on a context-specific definition of harmful content, we have nevertheless attempted to estimate the proportion of potentially harmful videos. 1.8% of feeds on YouTube are potentially harmful videos, and the estimate for TikTok is 2%. These are videos with explicitly violent or discriminatory content, such as beauty, diet and exercise, which are some of the largest content themes. The videos themselves may not be harmful, but their cumulative effect creates potentially harmful body and beauty ideals. See chapter 5.

5

The tech industry is expanding. The popular *short form* videos also serve another important function for the tech giants. They generate significantly more data points about our behaviour, interests, emotions and consumption. This is converted into a constant *feedback loop*, in which curation algorithms are optimized to increase retention. This infrastructure is essential for retention, and our data shows that this also applies to the revenue of the tech giants. See chapter 4.

Chapter 2

Methods & data

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The study focuses on TikTok, YouTube and Instagram

To illustrate how the tech giants retain users, we have chosen to focus on three of the most popular social media platforms: TikTok, YouTube and Instagram.

The figure on the right divides some of the most used social media into their primary functions: gaming, chat or content. Some media platforms are hybrids and overlap between the categories, for example, content and chat are prominent features of Instagram. Despite Instagram's widely used chat function, the three selected social media platforms are largely content-oriented.

Although the three media platforms have visual content in common, they also differ in their design concepts and interaction options, which has varying significance for how they retain users.

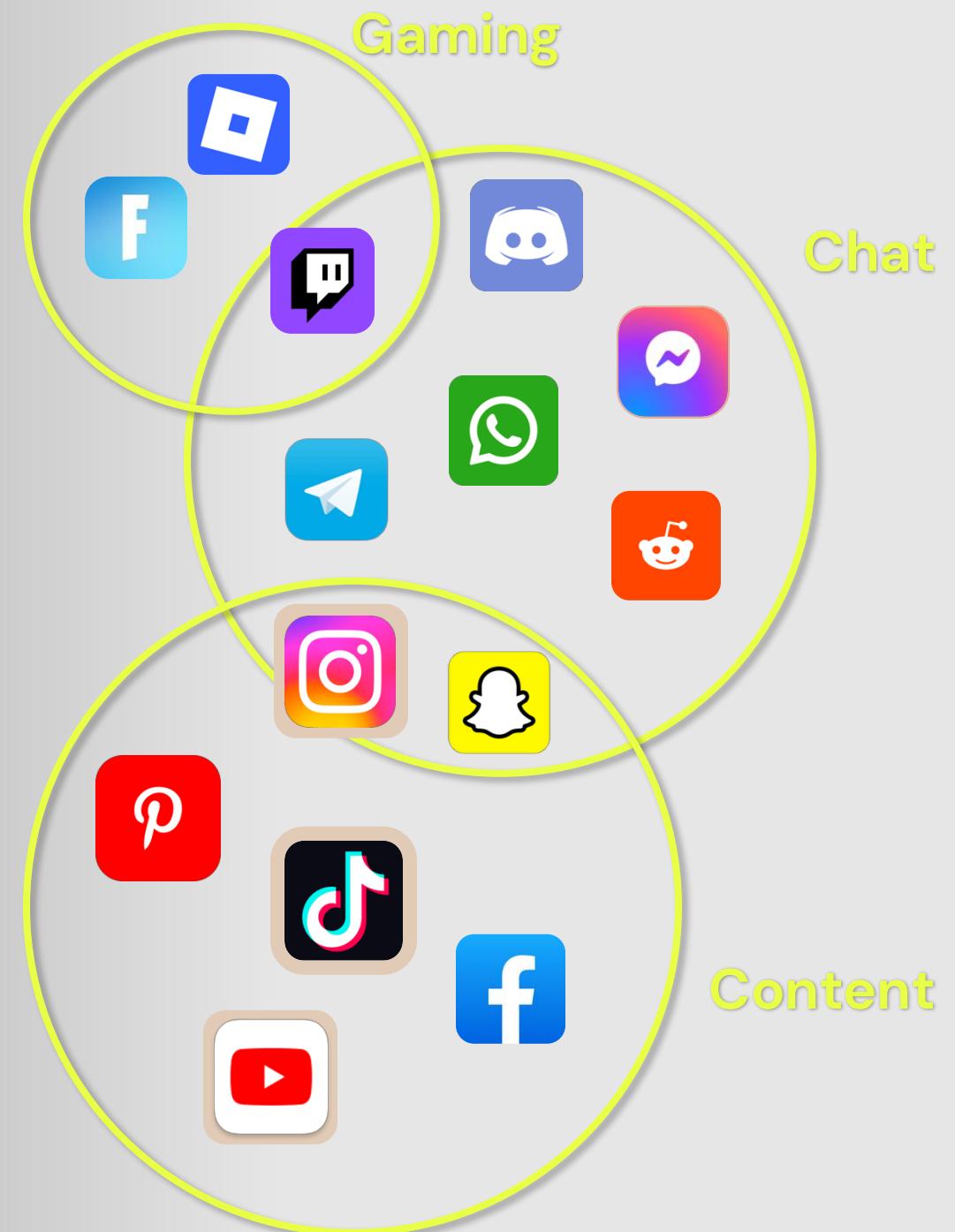
This section will review our data collection and utilisation methods, including the challenges of accessing the data.

YouTube

YouTube was a huge success from the very beginning, as the first easily accessible knowledge-sharing platform that required neither a user profile nor payment – just an internet connection. This social media platform was established in 2005 and acquired by Google in 2006 [sic]. In addition to being a video platform on which users can upload, watch, comment on, and share videos, YouTube is also one of the world's largest search engines, where people search for information, entertainment, and much more.

After 20 years, the platform still revolves around video sharing, but it is also much more than that today. For example, YouTube has products that compete with both Spotify and various other streaming services.

Throughout its lifespan, YouTube has launched (and in some cases removed) several new formats and services. Some of the biggest additions are VEVO, YouTube LIVE, YouTube Gaming, YouTube Movie, and YouTube Kids. As previously stated, there is also the independent music service, YouTube Music, which is inspired by and a competitor to Spotify. Similar to other social media platforms, YouTube has also incorporated *short form content* – a format that we will expand upon later in the report – as competition to TikTok's content and Instagram's stories.



YouTube is currently the world's largest video platform and is used by many different users for many different purposes. From influencers who film video diaries about their everyday lives, their cooking or clothes shopping to private individuals who post nerdy know-how videos on craftwork or technology. The content is wide-ranging; from children's television to music videos and much more.

A significant gaming community has also developed on YouTube, where users upload reviews, *live streams* and *walkthroughs*, where they simultaneously film the gameplay and themselves playing the game on screen.

Where YouTube differs from other content-based social media is the ability to create long videos (up to 12 hours). This allows for deeper immersion and nerdiness. By comparison, videos on Instagram can be a maximum of three minutes long, unless it is a saved *live* session, which can last up to an hour. TikTok imposes a ten-minute limit on videos recorded on the app, although the platform allows users to upload videos of up to one hour.

In 2025, YouTube will host approximately 2.7 billion monthly active users around the world, of which approximately 4.7 million will be in Denmark (Esourcera, Statista).



INSTAGRAM

Instagram is a social media platform that allows users to share photos and videos, interact with other people's content, and follow friends, *creators*, brands or topics they are interested in.

By 2025, the medium will have gained a total of three billion active global users, of which 2.6 million will be in Denmark (CNBC, Statista).

Instagram began as a nostalgic photo gallery with filters that made users' photos look like analogue Polaroid photographs from the 1980s. Filters such as *Valencia*, *Rise* and *Sierra* gave the images a washed-out, dreamy look, often with low saturation and a warm tone. The platform was launched in 2010 and became especially common in Denmark from 2012, when it was acquired by Meta.

Until 2016, the characteristically square images were arranged in a chronologically ordered feed, with all the content sorted such that the most recent images appeared at the top. There was no *ranking* (beyond chronology) or tailored suggestions for content that appealed more to specific users.

In 2016, Instagram underwent a major redesign in which the recognizable and detailed logo depicting a Polaroid camera was modernized into a digital interpretation of the Polaroid camera with pink, purple, and yellow hues. This also saw the introduction of the algorithmic *feed* and *stories* format inspired by SnapChat, which had become popular at the time.

Instagram's current design is rather straightforward, with its focus on user-generated visual content. Like the other two media platforms in the report, Instagram has become a much more commercially-oriented platform. The platform makes it easy for individuals to become content creators and for companies to boost their brand engagement with existing and potential customers.

Instagram is also actively used by artists and creatives to build visual portfolios and to market themselves. The platform also accommodates many political organizations and activists who want to spread their messages and create debate. Ultimately, Instagram continues to be a platform on which individuals share selected moments and everyday experiences with friends.

Instagram differs from YouTube and TikTok in that it hosts a substantial number of influencers and brands that focus on lifestyle topics.



TIKTOK

From its beginnings as a *lip sync* app in 2014 (then called *Musically*) to its transformation into an AI-curated video juggernaut in 2025, TikTok's development has been marked by constant evolution, with its recognisable visual identity as a central theme. TikTok is a media platform on which users can create content in the form of short videos to which background music, filters, text, emojis and animated GIFs can be added. TikTok's personalised *feed* is called the *For You Page* and consists of content from the people and *creators* the user follows,

and content from around the world that has been selected based on the user's behaviour on the platform.

By 2025, TikTok will have a total of approximately 1.8 billion global users, of which 1.4 million will be in Denmark (Fourthwall, Statista).

Despite periodic redesigns, TikTok's signature features – e.g. the *For You Page*, *duets* and *stitches*¹ – remain central to and form the core of the platform's identity: content and formats that encourage the consumption and production of content that builds on existing video or audio content.

The latest and most notable change is the extension of video length in 2022 from three minutes to ten minutes, which allows TikTok to compete with the likes of YouTube with formats that allow for more creativity and geekiness.

Today, TikTok's content is much more than dance videos, although that remains a popular genre. *BookTok*, another trend that allows users to read and review books, has become so popular that it influences bestseller lists around the world. There is also *FoodTok* that provides a lot of recipe content, and *FitTok* that provides content about fitness, training and wellness. The vast majority of videos fall into the entertainment category, but there are also news and social engagement videos.

Despite being the youngest social media platform of the three, TikTok has hit the market in a way that has led other media outlets to imitate it – everything from its format to layout. In other words, TikTok has, in many ways, changed the way tech giants use user data, develop algorithms, and make huge profits.

1. Concepts for collaborative content that can be produced based on other users' content.

Data donations: More than mere methodology

WHAT ARE DATA DONATIONS?

This study collected data using data donations. This method involved asking donors – young users – to send copies of the data that tech giants have collected about them. They can gain access to their data by exercising their GDPR rights to request a data export file. They then sent this file to us and thereby gave us an opportunity to examine the minds of the tech giants.

The information contained in this data is extensive. We have received 17 million registrations, which include *likes*, searches, views and *swipes*, which the media platforms have collected and provided to the young people.

Some of the information that tech giants use to develop and fine-tune their algorithms includes the videos we click on, how long we watch them, when we scroll on, what we search for and who we message? For example, a user watching a video to the end is interpreted as a sign of interest – and the user is therefore likely to be suggested more videos in the same genre. Conversely, if the user *swipes* away quickly, the algorithm learns that the content does not appeal to that user.

One important factor is what the user views. Another factor is all the other actions mentioned above. This means, for

example, that every *like* or comment indicates a strong signal of interest. Searches may also reveal new areas of interest. At the same time, the systems record who the user interacts with and how the user's network reacts to their content. All of this informs the curation algorithms that sort through the platform's vast amounts of videos and decide what this particular user is likely to click on or watch next.

In summary, the data we gained access to through the data donations is mostly the exact same data the platforms themselves use to tailor our experience and retain our attention.

This method enables us to go back in time and see the videos the user watched at any given time. Even if a person is 18 years old at the time of the donation, we can go back, for example, to the time they created the profile and see their earliest activities when they were significantly younger. The youngest of our donors was not yet 9 when they were first registered.

Unlike other studies that are based on surveys, interviews, etc. our data has been collected by the tech giants themselves, which means we do not have to rely on people's memories of when and how much they use social media and what types of content they are interested in. In other words, we look at their actual behaviour on the platforms.

ETHICAL CONSIDERATIONS

The data export files that donors receive from the tech giants are incredibly comprehensive and can contain highly sensitive information spanning many years. They often contain data that the person may have forgotten or was unaware still existed, such as private conversations, photos, videos and location history.

Our data collection is based on the premise that donors do not have a full overview of the content of their data export files. We have, therefore, taken full responsibility for protecting their privacy throughout the data collection process. To do this, we have applied the principle of data minimization.

The study is only interested in registered events, i.e. actions, either user-initiated or automatic, that are recorded with a precise timestamp and a description. All other data, such as the content of messages, images, contact lists or other sensitive information, is irrelevant to our investigation and has therefore been filtered out.

This is technically implemented using a special digital platform that we have custom-built for the purpose. In addition to guiding donors through the data donation process, it is also designed with several filters that ensure that these unwanted files are filtered out on users' own computers before being sent to Analyse & Tal's databases.

In addition to data donations, donors have been given the opportunity to share demographic information about themselves. The only mandatory information requested is their age. This allows donors to donate their data anonymously.

We have also implicitly informed donors that their participation in the project is voluntary, and that they can withdraw their donations at any time.

RECRUITMENT

We recruited data donors for the study through a comprehensive recruitment effort that included an online campaign, direct outreach visits to secondary schools and colleges, and through existing youth networks. To acknowledge their time and contribution, all the young people were offered a token financial compensation or a cinema ticket for donating their data.

RESTRICTIONS

Non-representative selection: The data donors are a self-selected group, and the results cannot be generalized to include all Danish youth. The data provide in-depth insight into a specific group which is not statistically representative of all young people.

Differences in data quality: The three platforms do not provide data in the same format or with the same degree of comprehensiveness. These differences make direct comparisons across platforms challenging.

The "black box" of algorithms: We can see what a donor has seen/watched, but we cannot see why the algorithm chose to present that particular content. Our data is a look into the donors' interactions with the system, but not into the inner workings of the system itself.

In summary, despite the limitations of our data, they provide an unprecedentedly detailed window into the complex, abundant and diverse ways in which young people navigate social media today. It is this actual behaviour that forms the basis for the analyses and conclusions presented in the rest of this report.

DATA DONATIONS

More than just methodology



Source data

DEMOGRAPHICS

Our database consists of 272 data donations from a total of 219 young people.

They had the option of donating their data anonymously but were obliged to provide their age. The age range of the data donations is from 15 to 45, and the median age at the time of the data donations is 20. As previously mentioned, data donations make it possible to go back in time and, with certain donations, to see users' behaviour from the time they created their profiles. If we look at the ages at which the earliest events were created in the data, we can see that most are under 15 years of age when first registered, and that 5% of users are under 9 years of age the first time they use one of the media platforms.

In addition to age, donors had the option to provide their gender. Based on those who indicated their gender, we can see that 33% of all donors are female, while 24% are male. In addition, one donor is non-binary, and one donor has another gender identity.

We have 104 donations from Instagram, 97 donations from TikTok, and 71 donations from YouTube. A few donors have donated data from two or all three platforms, but not enough to allow comparative analysis across Instagram, TikTok and YouTube.

BEHAVIOUR & CONTENT

Overall, our database consists of over 17 million registered events. As previously mentioned, these 'events' are individual actions. This means an action performed by the person themselves, including all the content they scroll past. Everything is recorded with a precise timestamp, a description of the action and any metadata. Examples of such registrations include:

- 10/02/2025, 14:05:14: User X began a video with the ID kASD32l41bhds
- 11/03/2024, 14:05:14: User Y searched for "cat videos"
- 01/09/2019, 14:05:14: User Z *liked* a video by @rirapogrup

However, the three platforms do not provide the exact same data. There are minor differences in the data export files, which have major consequences for the use of the data donations. The following sections will generally describe what data the different platforms provide.

YouTube provides a history of viewed videos and searches that goes back to the time the user created their profile. The first registration we received is from August 2010. There is a total of 1.6 million registered events. The unique strength of the material in our dataset is its historical depth. The fact that the oldest registrations go back to August 2010 makes it possible to follow some users' media consumption over more than a decade.

TikTok is the undisputed heavyweight in our dataset in terms of sheer volume. With 13.5 million registrations from 97 users, the platform accounts for almost 80% of all data collected. This reflects a very high intensity of use. The median user in our dataset has over 130,000 recorded events on TikTok alone.

Behaviour on TikTok is characterized by almost completely passive consumption. A full 96.7% of all registrations are viewed videos. Other interactions such as *likes* (2.3%), comments (0.4%) and shares (0.2%) constitute a negligible element. However, one important methodological note is that TikTok's data export for most users only contains video history for the past year. We can see other activity further back, but video consumption itself only spans 2024 and 2025.

We have 2.1 million registrations on Instagram. Unlike YouTube and TikTok, we cannot see when users began watching a video or post. Instagram does not share this information when a user requests a copy of their data.

Thus, a full 56% of all registrations are related to the messaging function, while the second largest category is *likes* (37.5%) which, on Instagram, represents the primary way to appreciating other people's content.

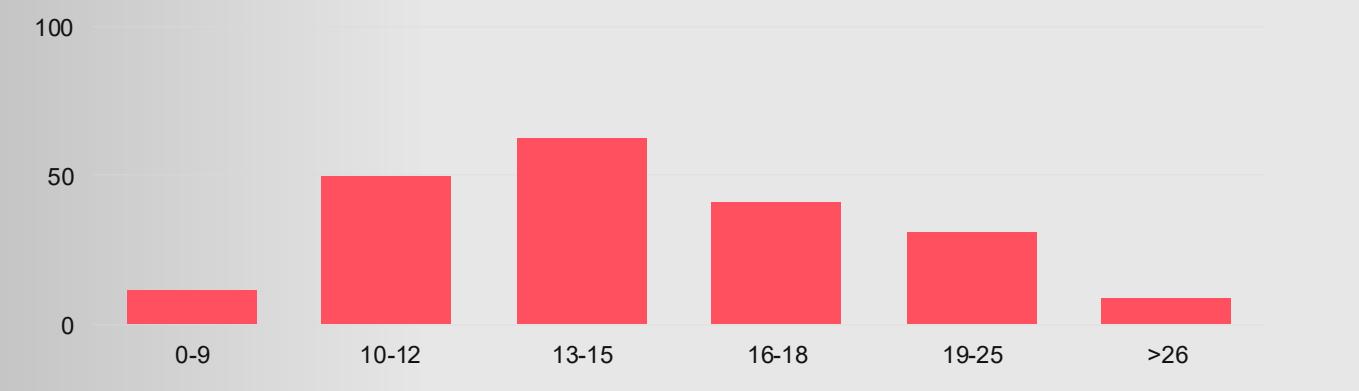
This means that the data on Instagram could not be used to directly investigate what content users are exposed to on the platform, as this data is hidden from us.

The ages of those who donated



When people donated data, they were asked if they wanted to provide their age. 218 people stated their age, 1 has not stated their age.

Age upon first registration



Age upon first registration on a platform indicates how old donors were when they first created a profile on one of the three platforms

How we analyse behaviour and content

Once we have received the donated data, the next step is to prepare it for analysis. First and foremost, this requires coordination and cleaning up, as data from different platforms is structured differently and may contain errors and duplicates.

An important part of this process is the ability to measure sessions. This means quantifying how often a user is on the media platform, how long they are typically active each time, and how long their breaks are. This is only possible on YouTube and TikTok because we can follow the order of videos viewed. To identify sessions, we group videos watched consecutively with a 2-minute buffer on TikTok to reflect natural breaks in usage.

In order to make these calculations, we need to enrich the data with additional information about the individual videos. We do this by retrieving metadata from YouTube's official API and *scraping* information on TikTok. This will be elaborated upon in the next section.

Metadata may, for example, contain:

- The video's title and description
- The video's creator
- Number of views and *likes*
- The video's duration

Duration is particularly important because it allows us to calculate how long a person has watched a particular video and, therefore, the length of their entire session.

From YouTube, we were able to retrieve metadata on all videos in the material, while on TikTok it was possible to enrich data for approximately 35% of the videos viewed (corresponding to 4.5 million views and 1 million unique videos).

The result is a comprehensive and more detailed database in which we can see the users' specific actions and link them to the characteristics of the content.

The analysis was based on the records of when users performed certain actions. In most cases, it is the time when the relevant user began viewing a video, and information on the length of the video, that have allowed us to assess how long their attention had been retained. Aggregating this information has allowed us to identify the popular types of content, and profiles that create content that achieves high levels of popularity.

The data has also allowed us to examine which videos and profiles are only shown to a few users and which are shown to our entire population.

The large amount of data and the lack of access to the videos themselves have made it necessary to examine the content through the text descriptions of the videos. They provide some information but not exhaustive descriptions of what the videos contain.

We have, therefore, also qualitatively reviewed random samples of the content and entire sessions to get a sense of the videos' real content and the context in which they appear when added to a *feed* side by side with other videos.

The time registrations have also enabled us to investigate when users utilise the platforms, when they are active, and how long they are active at a time.

Combined with information about the actions users performed on the platform, this has made it possible to compare, for example, how often they watch videos with how often they perform a search.

Finally, we used the source data for a *bottom up* estimate of how much TikTok earns from exposing young people to advertising. In other words, we base our calculations on the raw records of the number of videos that data donors viewed.

Access denied

How much data do tech giants provide access to?

We set out to investigate content on Instagram, TikTok and YouTube. Some of the most popular social media platforms among Danish adolescents.

However, when we received the donation data, it became clear that there is a big difference in how much data the three social media platforms provide to their users – even if they request “all available data”.

Of the three media platforms, YouTube provides the most historical data. YouTube’s data goes all the way back to when users created their profile.

TikTok only provides data that goes back a single year. On the other hand, TikTok provides more types of data than YouTube. It has not, therefore, been possible to conduct historical analyses of TikTok’s data, but we have been able to conduct very granular analyses of retention and harmful content.

Instagram has been the most inaccessible social media in terms of users’ access to their own data. It has not, therefore, been possible for us to analyse Instagram’s content at all.

This leaves a big gap, and begs the question:

What guidelines for data access are needed in the EU if we want to ensure transparency and access for researchers and legislators?

Data access: How much data do the social media platforms provide?

In this section, we review the data contained in the donations as well as the obstacles we have encountered along the way, and address why it is impossible to analyse the content of the data donations from Instagram.

As previously mentioned, the three social media platforms provide different types of data when the GDPR right to data portability is exercised. The GDPR gives all users the right to be provided a copy of their personal data collected on the relevant platform.

The difference is partly due to the social media platforms having different technical structures, and partly because they have different concepts of which data they consider to be personal data, and which must therefore be disclosed by virtue of the right to data portability.

The options for examining how a feed is structured also vary. This is because various obstacles have been put in place. We'll now take a closer look at that.

YouTube provides the most retrospective data, which thus requires a high level of technical skills.

YouTube provides the full feed history, which makes it possible to reconstruct when the relevant user performed a

specific action, all the way back to when they created their profile. We can analyse when and what they searched for, as well as when they viewed a video, and much more.

However, analysing the content requires us to enrich the data. This can be done using a technical function called the YouTube Data API. This data enrichment makes it possible to recreate an exact reflection of when the user watched a video, and to determine things about the content of this video by examining information about the sender, the description of the video, etc. YouTube does not automatically provide this information to the user.

TikTok delivers a lot of data, but only for the previous year

TikTok's data provision is different and more difficult to work with. Even if we use the data TikTok has made available for this purpose, it is impossible to analyse the data.

Basically, TikTok provides a feed history like YouTube. This also consists of a series of timestamps that register when the user performed a particular action. One important difference between TikTok and YouTube is the data regarding the content viewed, i.e. which videos users watched which accounts for the

vast majority of activity. In this instance, TikTok only provides data from approximately the previous year. This is despite the fact that we can see that the user has been active on TikTok for years. This makes it impossible to look further back than the previous year.

There is also an issue with enriching the feed history. The solution TikTok provides for this purpose is the TikTok Research API, a research-oriented access to TikTok's data, which should make it possible to conduct studies such as ours. We have utilised this access, but its limitations make it impossible to analyse the entire feed. We can only get metadata for 20,000 videos per day.

This restriction is called a *rate limit* and is common practice for research access to tech providers' data. There are some 20,000 videos which means that enriching the data is very time-consuming in our study. In fact, this is so time-consuming that it will take over 2 years to complete this part of the study. The *rate limits* on TikTok's research API make it impossible to research the feeds of more than a handful of users at a time.

To enrich the dataset from TikTok and make it usable for the study, we have found a solution involving the *scraping* of data. For this, we have created a large number of bot accounts that imitate real users and visit the same video links as the users in our study. This has allowed us to enrich approximately 1 million videos, which corresponds to 4 million registrations. Our bot accounts have been active for a month, at a cost of DKK 15,000. This *scraping* access also requires greater investment in server capacity and software development skills – something that ordinary research teams do not have access to.

Which is why we are in a situation where we must operate on a scale and with skills

that are close to those of the tech giants themselves, if we want to keep up with them and observe what is happening in users' feeds on a large scale. Despite the challenges, it is possible to work with the data from YouTube and TikTok. As previously mentioned, the situation is worse with Instagram.

Instagram provides very limited data

When users have exercised their right to data portability in order to donate it to us, Instagram did not provide a copy of their feed history like the other two platforms. Instagram only provides a history consisting of the videos that users have *liked*. This means that it is impossible to gain an overview of what content users have actually seen. Instead, we can only see what they thought. This prevents an analysis of what young people have been exposed to on Instagram, even though we have good reason to believe that this data is being collected; e.g. in the form of image and video views.

This is a matter of interpreting obligations and what is considered personal data. For the purposes of this analysis, the various limitations mean that:

- TikTok content only covers the previous year (spring 2024 to spring 2025).
- TikTok content is limited to 1 million out of 5.3 million unique videos.
- Instagram does not appear in the analysis despite numerous data donations.

Thus, the following analysis is based on data from TikTok and YouTube. However, we assume that several of their retention mechanisms are similar to those found on other social media platforms.

Chapter 3

What is
retention?

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Retention – scope and methods?

This chapter will examine retention in depth based on various significant aspects of social media.

We begin by looking at general behaviour on TikTok and YouTube to get an idea of how long, how often and where active users are using these media platforms. We then examine how content formats have changed, and what specifically characterizes the trend towards shorter content – popularly known as *shorts* – and the impact this has had on retention. We also turn our attention to design features and functions that promote retention.

In Chapter 4, we take a closer look at how tech giants continuously optimise their infrastructure, including algorithms and marketing opportunities, which make it more difficult for users to escape and to understand the influence and exposure they are subjected to.

In Chapter 5, the analysis shifts focus from behaviour to content and takes a closer look at the millions of videos that the project's donors have afforded us insight into. We particularly focus on advertising and the harmful content that young people are exposed to.

Our study shows that, as a group, young donors are active on YouTube, TikTok and Instagram throughout the day. From the moment they wake up until they go to sleep, one of them is always online.

The data donations have given us access to detailed information about the donors' actual behaviour, giving us unique insight into their activity over days, weeks, and even years in some cases. We can see how users often start with brief check-ins in the morning but gradually increase their use throughout the day – especially in the evening, when many young people spend several hours in a row on social media. Over time, a pattern of almost constant presence on digital platforms is forming across the board.

Our donors' data shows that from 2019 to 2024, the time spent on YouTube has doubled. On TikTok (where we only have data for one year – 2024–2025), we see that young people are active for an average of 1.5 hours per day.

How are those 1.5 hours spread out over the day?

Retention is not just about being on a particular platform for long periods at a time. Many of the retention mechanisms used by tech companies also cause us to increase the number of times we reach for our phones to check what has happened on social media since we last looked.

It is thus often more interesting to look at what we have already referred to as 'sessions' in this study. A session is every time a user opens the relevant social media platform until they close it again or they are inactive for 2 minutes.

On average, young donors are active 90 minutes per day on TikTok, spread over 20 sessions, and spend 70 minutes a day spread over three sessions on YouTube.

However, there is a big difference in how much and how often young people use social media. In the figure below, the black line indicates the average number of videos watched per person each hour over 24 hours.

The top line represents the 10% of donors who watch the most videos. On average, they watch 895 videos per day. Conversely, the bottom line indicates the average number of videos per hour for the 10% of donors who watch the fewest videos, averaging 52 videos per day. These are of course averages and vary over a 365-day year.

Regardless of how much content users consume per day, the graph shows that the circadian rhythm of social media use is largely the same for everyone.

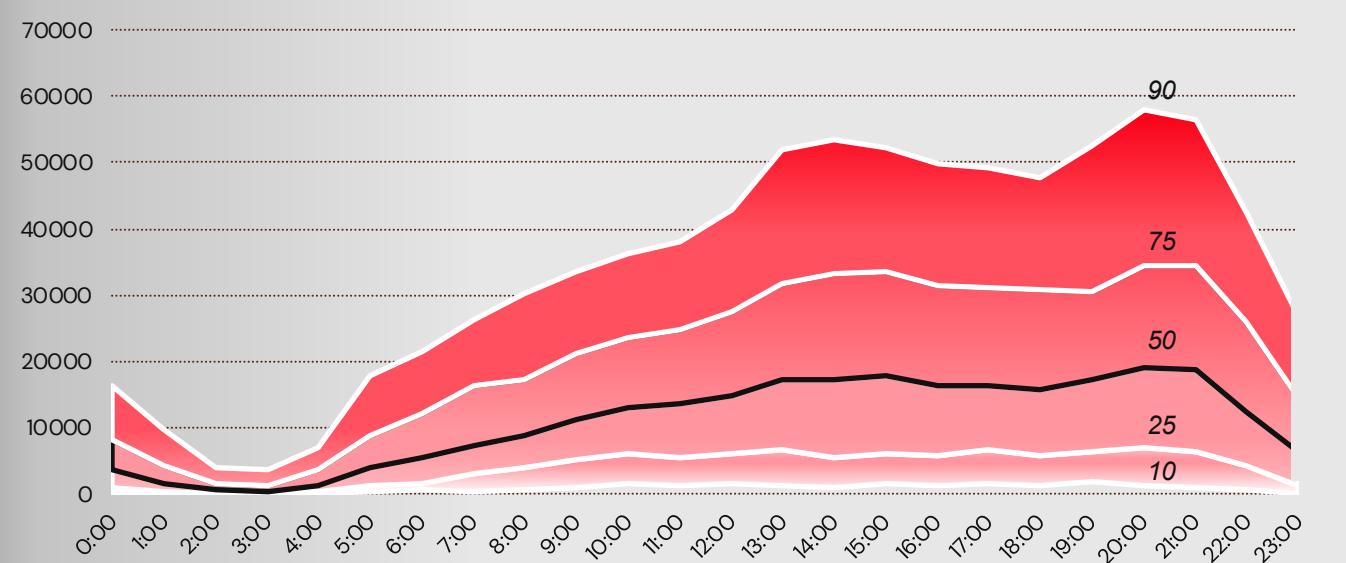
Activity is low from 1:00 a.m. to 5:00 a.m., presumably because most people are sleeping. Usage increases in the morning hours, and usage is fairly stable from 9:00 a.m. to 7:00 p.m. We see a large peak after dinnertime, which lasts until 10:00 PM, after which it drops towards nighttime.

This means that, as a group, users are accessing social media all day long. We also see that social media is not used less during, for example, school and work hours. During this period, social media is accessed every hour.

The conclusion is that our young data donors are retained, and that they are retained to varying degrees. Which is why we will now explore different behavioural segments to understand how they are retained in various ways and to varying degrees.

The number of videos viewed per hour throughout the day

The black line is the median number of videos users have watched per hour. The red areas show the range for the 10% who watch the most videos (90th percentile in the upper area), the range for the 25% of users who watch the second most videos (75th percentile in the area above the black line), the range for the 25% who watch the second fewest videos (25th percentile in the area below the black line) and finally the range for the 10% of users who watch the fewest videos (10th percentile in the bottom area).



Data: 2024-2025 data from TikTok for donors under 18. The figure is based on a total of 38 people and 6,633,019 videos.

Three types of behaviour

To investigate differences in behavioural patterns, we have chosen a methodology that considers not only the classic demographic variables such as age, gender and education, but can also calculate similarities and deviations among users based on their behaviour on social media.

An outline of three user segments emerges from these patterns, each representing different ways of being engaged and retained. As can be seen in the summary on the right, the segments differ significantly in the intensity and frequency of their use.

It is noteworthy that all three segments have an equal distribution of men and women, and of different ages. It is, therefore, the classic variables that determine how social media is used.

On the other hand, the use itself gives us relevant information on retention. There are several ways to be retained. Segment 1 is retained by frequently checking TikTok for something new. Segment 2 has fewer sessions but is retained for longer periods. Meaning the phone stays in their pockets longer before a new session is begun. And finally, there is segment 3, which is less frequently on TikTok, and for shorter periods. We will return to the pursuit of dopamine, which explains one retention mechanism that influences this behaviour.

SEGMENT 1: RETAINED BY CONSTANT ACTIVITY



Short frequent sessions
22 sessions per day
25 videos per session
One session lasts 6 minutes

Proportion of people: 24%

Most active at 5:00 PM

Most active on Thursdays

SEGMENT 2: RETAINED WHILE ON THE PLATFORM



Fewer sessions but of longer duration, viewing significantly more videos
14 sessions per day
48 videos per session
One session lasts 8 minutes

Proportion of people: 35%

Most active at 8:00 PM

Most active on Sundays

SEGMENT 3: SEGMENTED CONSUMPTION



Fewer and shorter sessions
8 sessions per day
16 videos per session
One session lasts 4 minutes

Proportion of people: 41%

Most active at 8:00 PM

Most active on Sundays

Case study: 24 hours on TikTok

Laura
15 years old

Laura is one of the young people who is very active on TikTok. Her day is filled with social media content – from the moment she wakes up until she goes to bed. Some days she's on social media almost the entire day, and other days she puts her phone away a little more often. Over the past year, not a single day has gone by without Laura opening TikTok. On a typical day, she spends 3 hours on TikTok, viewing 1,012 videos in 7 sessions. That's equivalent to 42 videos per hour over 24 hours, including nighttime. Over the past year, this equates to Laura spending more than 40 days watching videos on TikTok. That corresponds to 12.5% of the day.



Go short or go home!

It's not just algorithms and design that make users stay on social media for a long time. The type and format of content is also evolving, and tech giants are constantly searching for the new content format or optimisations that best retain users.

In 2025, the most enduring video format – *short form*, also known as *shorts* – will be impossible to ignore. It has gradually been integrated into many of the largest social media platforms, predominately focussed on content.

Short form first became very popular and mainstream when the American platform Vine launched in 2012. On Vine, users could share 6-second looped videos called 'Vines'. It was a very simple concept, but it was enough to propel Vine forward. In just 3 years, the platform gained more than 200 million active users globally. That is impressive growth. X, formerly Twitter, spotted this potential, and just 4 months after launch, it bought Vine from three young entrepreneurs for around DKK 192 million. Early in Vine's lifetime, image-based social media gained traction, and Vine attracted serious competitors, such as Instagram and Snapchat. This competition resulted in X burying Vine in 2017.

During Vine's lifetime, the proportion of users on social media increased from 15% of the world's population to 37% (DataReportal). The short format stuck, and shortly after Vine closed, TikTok was launched in Europe. Since then, the proportion of users on social media has grown, and today the figure is approximately 64% of the world's population, and a full 94% of internet users are on at least one social media platform (DemandSage).

This development was characterised by design convergence. This trend manifested itself in quite uniform developments across social media. If one platform finds a design concept or format that *performs* well and wins users' attention, several competitors often follow suit. This has been the case with *shorts* for example. As further affirmation of the short format, Instagram introduced *reels*, its version of TikTok's *shorts*, in 2020. YouTube followed shortly after with the introduction of *YouTube Shorts* in 2021.

This development has proven to be very successful. The figure on the right shows that, since the launch of *YouTube Shorts*, time spent on YouTube has increased from 36 minutes to 70 minutes per user per day.

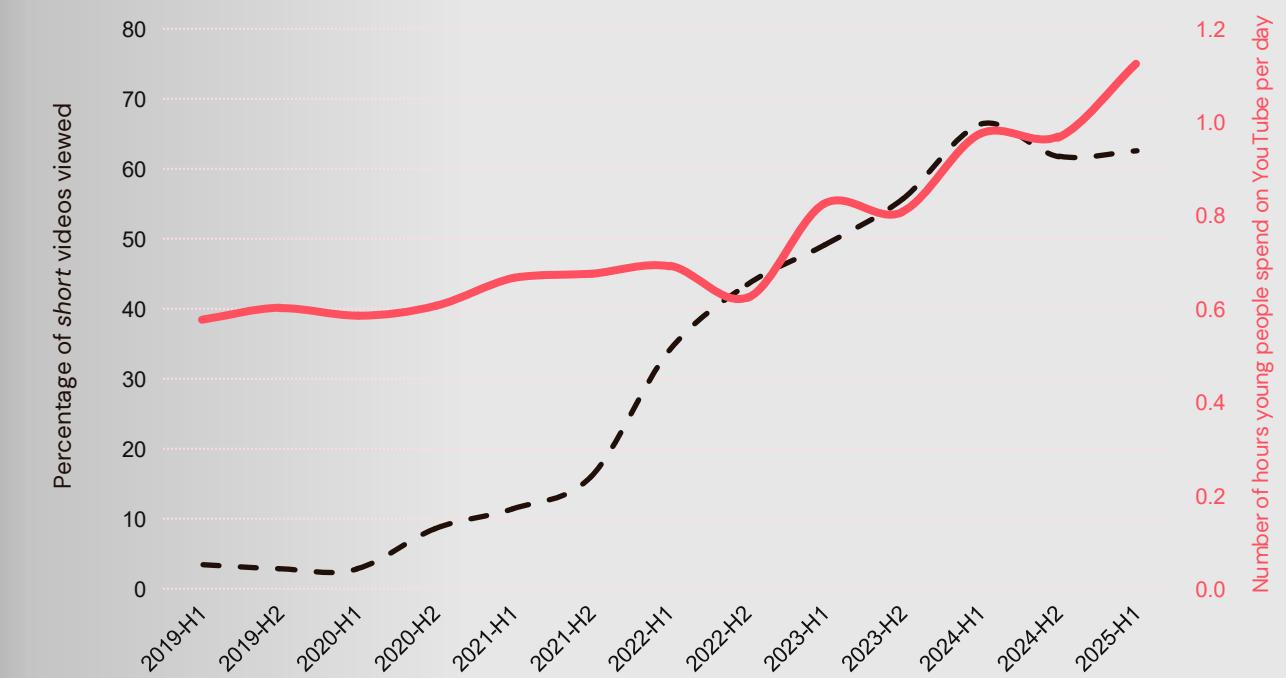
Time spent on YouTube has doubled since the short format was introduced

As the name *shorts* indicates, the content is short. This means that users quickly experience immediate gratification from viewing, for example, a *prank*, an inventive hack or by gaining new information. Every time a user watches a video that is particularly interesting or entertaining, it triggers dopamine in the brain. Each engaging short video triggers a chemical in the brain that feels like a reward and encourages users to keep scrolling to find the next gratifying *hit* – especially as the content triggers dopamine to varying degrees, which encourages us to seek content that triggers the most dopamine.

This format is also convenient to use because its short length is adapted to most situations – when the queue at the supermarket is long or your parents are a few minutes late picking you up after soccer practice. As a result, engagement with the content has a low threshold. Consequently, *shorts* not only help to keep us engaged while we are on the platform, they also effectively bring us back to the platform as soon as we have a spare moment.

Finally, *shorts* have led to a rise in the number of stimuli we are exposed to on social media. Platforms have thus gained a greater level of "pulse". In just a few seconds, users can jump from one place on the globe to another, and from one music genre or state of mind to another. The combination of the constant pursuit of dopamine and complex and intense stimuli requires a high level of adaptability and self-awareness on the part of users.

YouTube: Trend in the proportion of *shorts* (black) compared to time spent (red) over six months



Your favourite brand has gone live

Although much of the content on social media is permanent and remains on the poster's profile, where it can be viewed again and found by new users, ephemeral content has become increasingly popular on social media.

For example, SnapChat was launched in 2011 with the central concept being that shared photos and videos would disappear after being viewed. SnapChat was a counterpart to social media platforms like Facebook and Instagram, which placed particular emphasis on long-lasting content. In 2013, Snapchat introduced its *stories* format, allowing users to post photos and videos that were visible for 24 hours.

The format was a success and did not go unnoticed within the industry. In 2016, Instagram launched its *story* format, which was almost identical to that of SnapChat. Shortly after, Facebook, Messenger and WhatsApp – all owned by Meta – each released their own versions of *stories*.

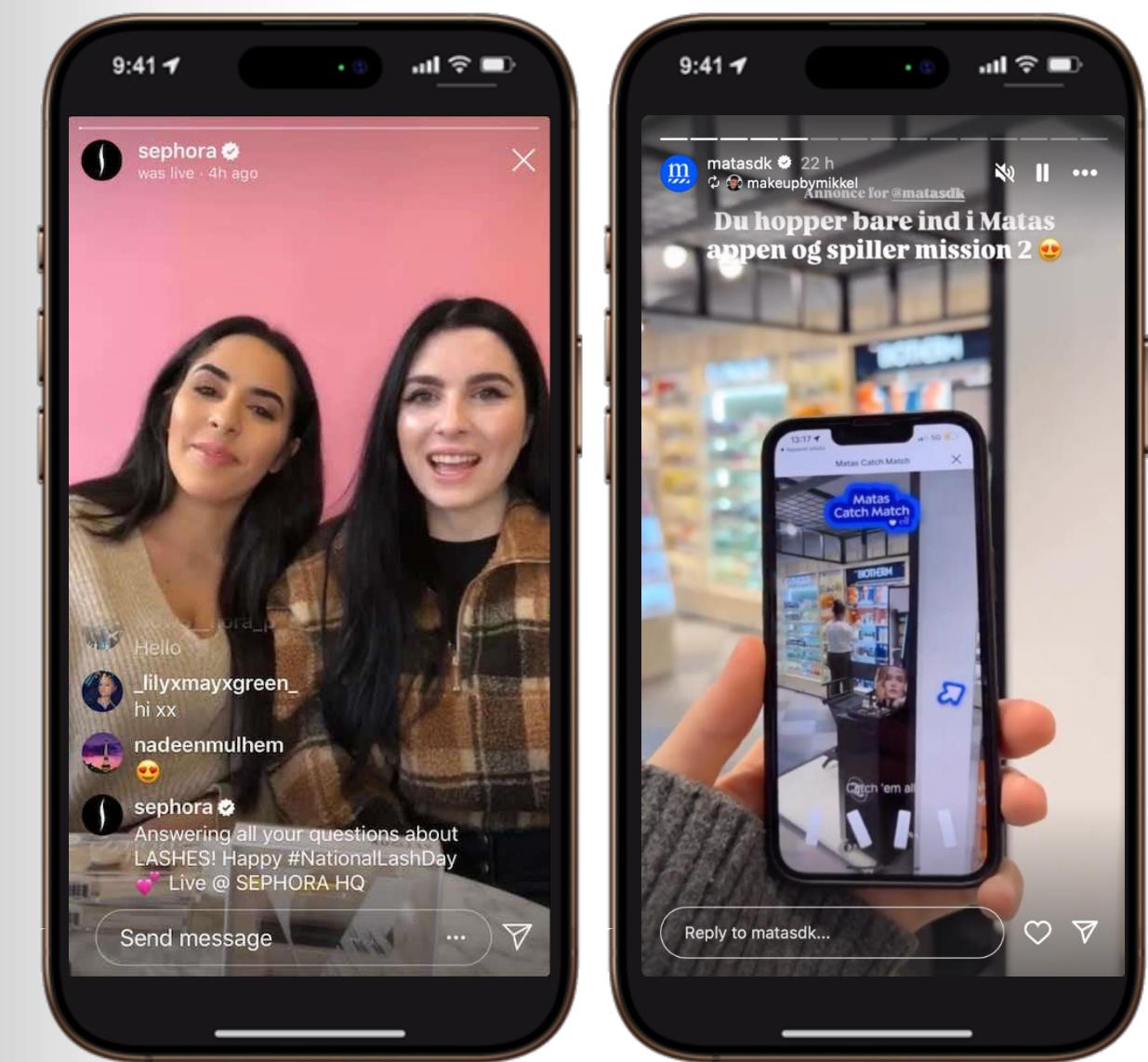
The quantity of this ephemeral content has since grown, and Instagram's *live* feature is another ephemeral format on which private users and brands alike can stream live, while followers can comment and ask questions that appear immediately on the screen and which are visible to everyone watching this spontaneous interaction between, for example, a brand and a user. Such live sessions typically remain on the brand's *profile*, where it can be viewed repeatedly.

Both *live* content and *stories* offer what appears to be raw and *casual* content, even though there is often a carefully planned corporate strategy behind them. The format seems authentic, accessible and more intimate than *in-feed* posts and *reels*, which are edited before publication. Which is why many brands and influencers frequently stream this type of ephemeral content to strengthen their bond with their followers, who often become more engaged with the content of the relevant profile and are therefore more likely to check social media for any of the poster's *stories* or *live streams*.

FOMO

These ephemeral formats are thus particularly retentive due to both their content and their limited availability. In addition to appearing authentic, the format appears to be alive, in constant motion and thus potentially just as real a part of life as spontaneous activities in everyday physical settings such as school and after-school clubs.

The time limitations of these formats create an incentive to frequently check social media, because users learn that there is a risk of missing events that may be important to their social life, a condition that stimulates the fear of missing out, also known as *FOMO*.



Enduring design

Digital UI (*user interface*) and UX (*user experience*) have proven their effectiveness in terms of their ability to retain users. This section provides an overview of the most important design methods and concepts that promote retention. As social media is constantly evolving, it is likely that several features mentioned here have either been changed or removed during the preparation of this report, while new ones may have been added. One point remains, however: The design of social media is a key element of its addictiveness.

We examined the design mechanics of Instagram, TikTok, and YouTube from several perspectives. As a framework, we mapped the platforms' design development from their launch to the present day. We also created proforma/fake users on all three platforms to examine the overall design and initial creation of a profile. Finally, we mapped out the underlying functions, such as advertisements and the algorithmic design of feeds by reviewing documentation and through Analysis & Tals' previous experiences.

This section covers the visual and algorithmic design and overarching functionalities.

VICIOUS CIRCLE

One design concept that is widespread across social media, e-commerce and news sites is *infinite scrolling*. This design ensures that an app or website loads new content once you reach what would otherwise be a Next Page button at the bottom of the screen. This design is prevalent on Instagram, YouTube and TikTok and ensures a streamlined user experience that minimizes users' decisions, friction and waiting time. This is especially useful from a business perspective, because potential customers or users don't even have to decide whether they want to see more content. Any such decision is a disruption to the *flow*, and *infinite scrolling* minimises the risk of the upcoming content being rejected.

At the same time, the fact that the *scroll* is not interrupted means that there are no tangible markers for the user to perceive an accurate sense of time. In contrast, it is easier to create a sense of time if, for example, you have watched three separate episodes of a series or are on page seven of an online store, because each page is delineated. This can be described with the term that researchers call *flow*. A state in which, as the term suggests, one is so absorbed in an activity that one does not notice the passage of time.

This lack of a sense of time represents a continuum, and while *flow* is initially positive – you are so entertained that you forget time – the concept of time distortion is further along the spectrum and can be characterised by both over-stimulation and under-stimulation simultaneously. Over-stimulation because the user receives a wide range of different stimuli in a short period, and under-stimulation because the activity may be predominantly passive. Regardless of where the user is on the continuum, *infinite scrolling* is central to the retention mechanism of the *scroll*.

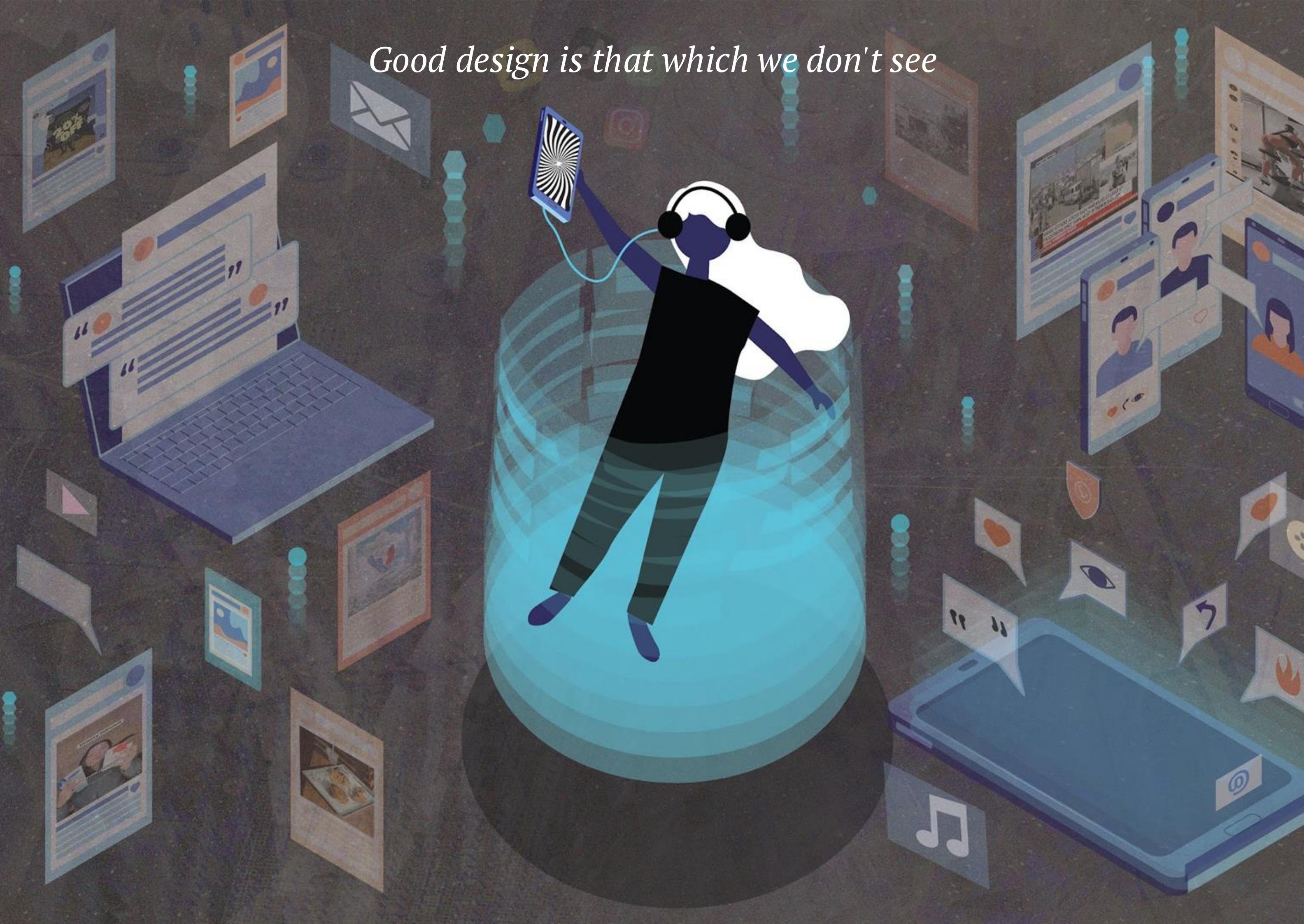
Another retention mechanism is *autoplay*, which is found on Instagram, TikTok and YouTube. As the term indicates, the design works in such a way that new content plays as soon as the previous content ends. If you are entertained, you will watch it all the way through, maybe even several times. On TikTok, for example, this repetition changes the white *share* icon into a green *message* icon that *nudges* the user to share with a friend. If you are not entertained, you quickly *swipe* on to the next item that the platform has queued up based on your perceived preferences.

Autoplay also removes natural pauses, which would require active decision-making to continue and could thus halt activity. The user does not need to actively do anything to continue viewing but must actively do something to stop.

Another retentive design feature is *notifications* and *push notifications*, both of which demand the user's attention. Regular notifications are sent within the app itself and are often displayed with an icon. This is often displayed as either a number indicating the number of notifications waiting for the user or as a red icon indicating that the user has unopened notifications. In this way, the media nudges users towards determined, and preferably continuous, activity while they are on the platform.

Push notifications are sent from the social media server to the phone and will typically appear on the screen even when the app is closed. These notifications *nudge* the user to reopen the platform. However, users can adjust which notifications they receive and the frequency thereof. For example, a summary once a day of what has happened on the platform. However, opting out of instant notifications can lead to what can best be described as 'phantom checking' your social media; i.e. looking for something that isn't there: *Now that I'm not being notified when something happens, something could be happening all the time... so let me check if I've missed anything?*

Good design is that which we don't see



INVISIBLE DESIGN

When considering social media design, one must also remember everything else that is not prominently displayed or highlighted on the screen. I.e. from a design perspective, everything the platforms would prefer the user not to notice but rather simply act upon. This prioritisation describes the concept of *dark patterns*. Common examples of this might be the small *exit X* or the *skip* button, which are often of a lighter colour than the rest of the text. Very often, these features must be included in the design but are not the choices the platform wishes the user to make.

Dark patterns highlight the fact that the design is intentional and influences our behaviour. Based on the platform's design choices and omissions, strong assumptions can be made about the platform's desired user behaviour.

ENGAGEMENT

This desire for continued activity is not surprising. As with any other industries, the overall success criterion for the tech giants is that their social media is used – preferably as much as possible. We use the term *engagement metrics*, which covers, among other things, *likes*, *comments*, *shares*, *saved posts*, *reposts*, *clicks*, *tags*, *mentions*, *replies* and *reactions*.

Using various *metrics*, tech giants introduce a social capital currency and offer a wide range of opportunities to acquire that capital through interaction with other users and through others responding to one's content. In other words: The higher the *engagement metrics*, the greater the potential for retention.

However, *engagement metrics* are about much more than retention. They are essential to the tech giants' business models because they provide valuable data to companies about which content has the best chance of engaging different types of users.

In the next chapter, we will take a closer look at the infrastructure that governs and influences design, content, user experience and business opportunities on TikTok, YouTube and Instagram.

CLEAR MESSAGING: CREATE CONTENT!

In order to profit from their operations, social media platforms operate like any other business: the more customers they have, the more money they earn. It is therefore a matter of getting existing customers – i.e. users – to continue consuming and attracting new ones. On social media, the product – i.e. content – must appeal as much as possible to the target group and constantly renew itself so that there is always something new to offer customers.

That is why content creation is becoming increasingly important on social media. This development is far from new, and it has been several years since the first users became *content creators* who could make a living from producing content for social media. These *creators* help ensure that the store has products that customers are interested in. Their crucial contribution has not gone unnoticed by the media companies themselves, who now offer everything from creator platforms and sponsor matching to specific analytic tools. All of these are tools that, from the user's

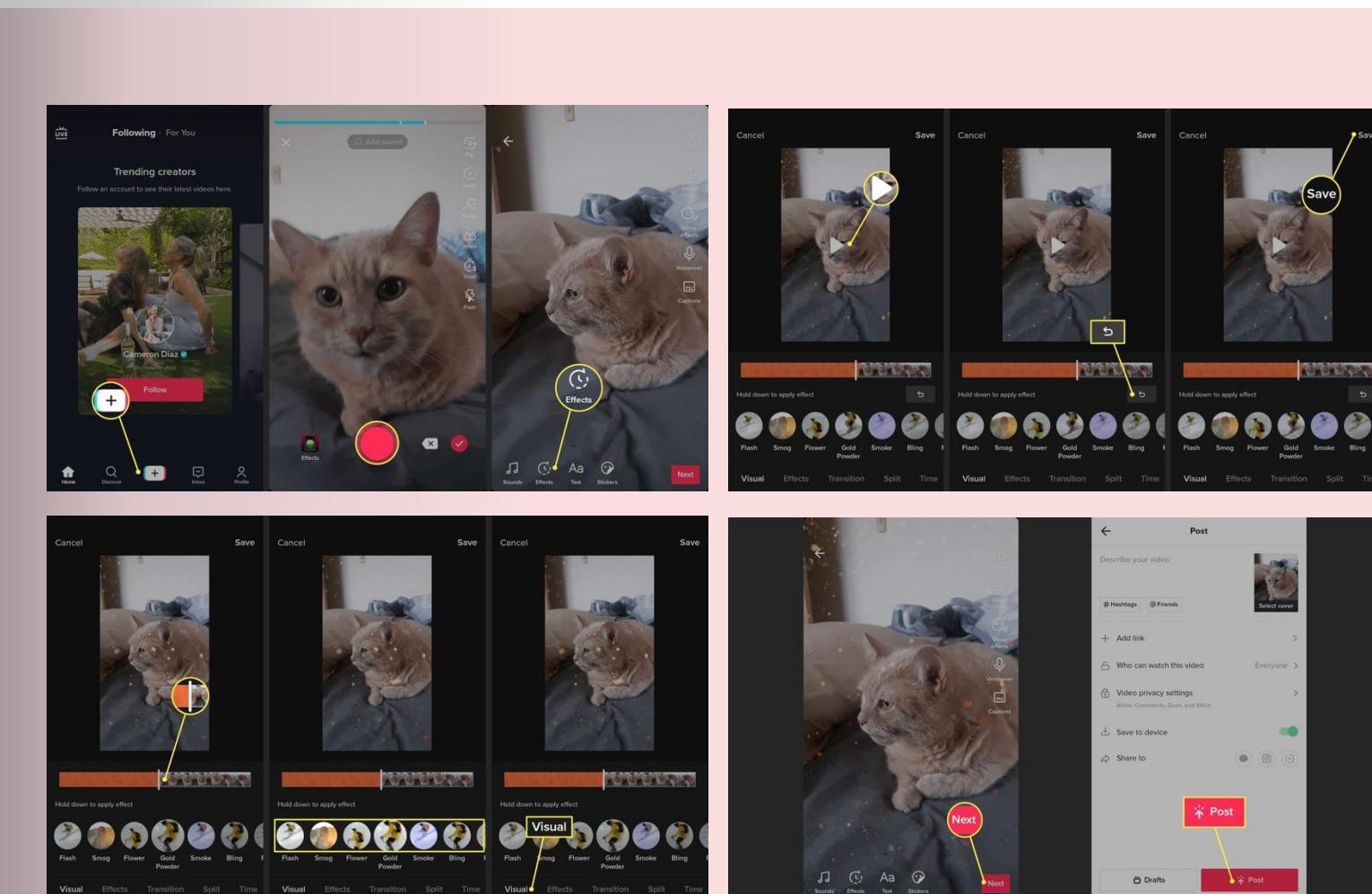
perspective, increase the quantity of content on the relevant social media platform. However, *content creators* do not receive financial compensation from the platforms but rather depend on payment from the brands they advertise.

Content creation is designed as a playful and intuitive interface, where the bar for use is designed to be as low as possible so that users can quickly and smoothly produce engaging videos. TikTok has been at the forefront of this and has made many design choices that *nudge* both *creators* and ordinary private users to make certain types of videos featuring rapid editing, strong colours, shifting images, sound and text – to name just a few features.

SMALL PARTS OF THE BIG PICTURE

Retention design has gradually become the criterion for success against which everything is measured when social media platforms develop new features or layouts. It is no coincidence that

- your right thumb can reach the like button
- an unknown artist without a large following appears in your feed
- you swipe and not click to move on to a new video
- you can award hearts that light up instead of likes
- you receive content about French food as you are planning a trip to Paris



DESIGN	DESCRIPTION	RETENTION	MEDIA
<i>Infinite scrolling</i>	There is an endless amount of content. New content is loaded continuously, either triggered by the user's own <i>scrolling</i> or when the user has finished watching a video.	This keeps the user in a continuous <i>flow</i> without interruption. In this way, the mechanism removes any natural pauses that might otherwise give the user a reason to stop the activity and do something else.	TikTok YouTube Instagram
<i>Autoplay</i>	When one video ends, the next one begins, and the user doesn't have to actively do anything to continue watching.	The uninterrupted stream of curated content keeps generating events (<i>views</i>), even though the user is effectively rendered passive. It also eliminates natural pauses that could lead to a halt in activity on the platform.	TikTok YouTube
<i>Notifications</i>	Information about activity on the platforms. Notifications may include a new message, a new <i>like</i> , or new content from someone you follow. The notifications appear as media icons on the phone screen when it is not open, or as icons in the app next to the domain to which the news belongs, e.g. messages, likes or similar.	They remind the user about the platform and what is happening on it while the user does not have the platform open. In this way, the notifications are designed to entice users back and can trigger FOMO if, for example, users can see friends writing in a chat group or receive a notification about new content from someone they follow.	TikTok YouTube Instagram
<i>Pull to refresh</i>	By pulling the screen down, the entire app interface moves downwards, and new content is loaded. This design mimics the well-known mechanism from the gaming industry's one-armed bandits.	The element of randomness and the desire for reward – dopamine-triggering content – makes this mechanism retentive.	TikTok Instagram
<i>Suggested searches and networks</i>	Instagram, TikTok and YouTube prompt their users, in various ways, to view specific content and which users to follow.	The better the content and network prompts, the more likely it is that users will like the content. This makes retention more likely, as there will be more to see and more people to interact with.	TikTok YouTube Instagram
<i>Engagement metrics</i>	Numbers on all types of actions a user can make in relation to other people's content. For example, a <i>like</i> , share and/or comment. On Instagram and TikTok, the primary metric is a heart, whereas on YouTube it's a <i>thumbs up</i> . Metrics can also be a poll, quiz or a question in a <i>story</i> .	These numbers give a user something to keep track of. <i>Are the number of likes and views increasing? Do others share and save my posts? Will I get more comments?</i> The more to measure, the greater the reason to follow and therefore be on the platform. The metrics are, therefore, a currency that both provides social capital and releases dopamine. They also provide information to the user on what kind of behaviour is socially rewarded.	TikTok YouTube Instagram
<i>The read function</i>	An indication that the message has been opened. This can either be indicated by an automated note below the message – "read" – or marked with the recipient's profile picture.	The function makes the platforms come alive, and the knowledge that a recipient has opened your message can encourage you to stay on the platform to see if there is a response.	TikTok Instagram
<i>Simultaneous interaction</i>	Users can view, comment on, <i>like</i> , and share content while viewing the content itself. This means that these interactions with the content do not interrupt the <i>flow</i> but are instead an overlay and can happen at the same time as viewing.	This feature makes it possible and convenient to interact with content and other users without being slowed down. This makes the user experience seamless, removes potential interruptions to the activity, and intensifies user engagement, which can prolong the session.	TikTok YouTube Instagram
<i>Auto-generated subtitles</i>	If a video with speech is uploaded, automatic subtitles can be generated, and the user can customize the style and size. The subtitles appear on the video as it plays for other users.	This feature allows you to continue watching content even if your surroundings are not conducive to sound.	TikTok YouTube Instagram
<i>Ephemeral content</i>	Users can upload <i>stories</i> , which expire after 24 hours. A new story is marked with a ring around the user's profile picture, so you can see whether there is new, unopened content.	The expiration date implicitly encourages users to frequently check the platform for content like this, because you learn that not everything can wait.	TikTok YouTube Instagram
<i>Swipe</i>	<i>Swipes</i> are used for navigation, which means that a user can <i>swipe</i> to new content with a simple movement from anywhere on the screen and thus continue their session.	This feature helps make navigation smooth and keeps your activity going. <i>Swiping</i> thus contrasts with other navigational features we are familiar with, such as an x in one of the corners of the screen, which often sends the user backwards rather than <i>flowing</i> forward, thereby interrupting the activity. Swiping ensures a flow in which the user can react immediately to a lack of interest and therein lies the retention factor.	TikTok YouTube Instagram
<i>Timeline</i>	A timeline runs along the bottom of the screen to indicate how far you have progressed through the relevant content.	The timeline shows how quickly the user is approaching the end of the content, thus creating a persistent incentive to view the content to completion.	TikTok YouTube Instagram
<i>Save/favourite/watch later</i>	It is possible to save content that you wish to revisit or may only have time to view later. This feature is referred to as save on Instagram, favourite on TikTok and watch later on YouTube.	This feature encourages users to maintain an archive on the platform with content they wish to spend more time on later. This offers the potential for further retention, as this is content that the user shows interest in and can easily access again.	TikTok YouTube Instagram
<i>Shopping integration</i>	The ability to make purchases directly via an <i>overlay</i> on, for example, a brand's profile, instead of having to go to an external browser to shop.	This feature allows users to make purchases without leaving the platform, thereby retaining the user rather than having them leave the platform to shop. The user can immediately continue viewing content after completing the purchase.	Instagram

Chapter 4

Circular infrastructure

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Data volumes are increasing

In this section, we shift our focus from what we can see on the screen to the underlying infrastructure that enables and optimises the tech giants' business. Firstly, we review the trend in the amount of data collected regarding user behaviour – at least what the platforms have disclosed in their data donations.

To understand the trend over time, it is most illustrative to look at YouTube's data which, due to its complete history, goes back many years. We base our calculations on the average number of videos that YouTube has registered for its users per year.

It is important to emphasize that tech giants like Google, which owns YouTube, collect many different types of data and metrics. The aim is not, therefore, to provide a complete picture of all data collection, but rather to show the trend in the registration of this particular behaviour. Our work involved filtering out large amounts of data, as Google's overall data infrastructure contains far more than data that relates specifically to YouTube.

THE TREND IN YOUTUBE'S DATA RECORDINGS

Until around 2016, the average number of registered data points for viewed videos remained relatively stable. After this date, there was a significant increase to around 2,000 registrations per user per year. This number covers the number of videos that the user begins viewing. The introduction of YouTube's *Shorts* in 2021 changed this significantly. We see a steady increase and a tripling of the average number of registered data points.

When compared with data collection for another type of behaviour – the number of searches per year – we see that the number of data registrations is stable, at approximately 300 per user per year. This indicates that a saturation point has been reached in terms of how much more and how much more new data YouTube can obtain from users' search histories.

On the other hand, the switch to *short form* has made it possible to register far more data points about what users are viewing and how they interact with the content.

TIKTOK: AN EXPLOSION OF DATA

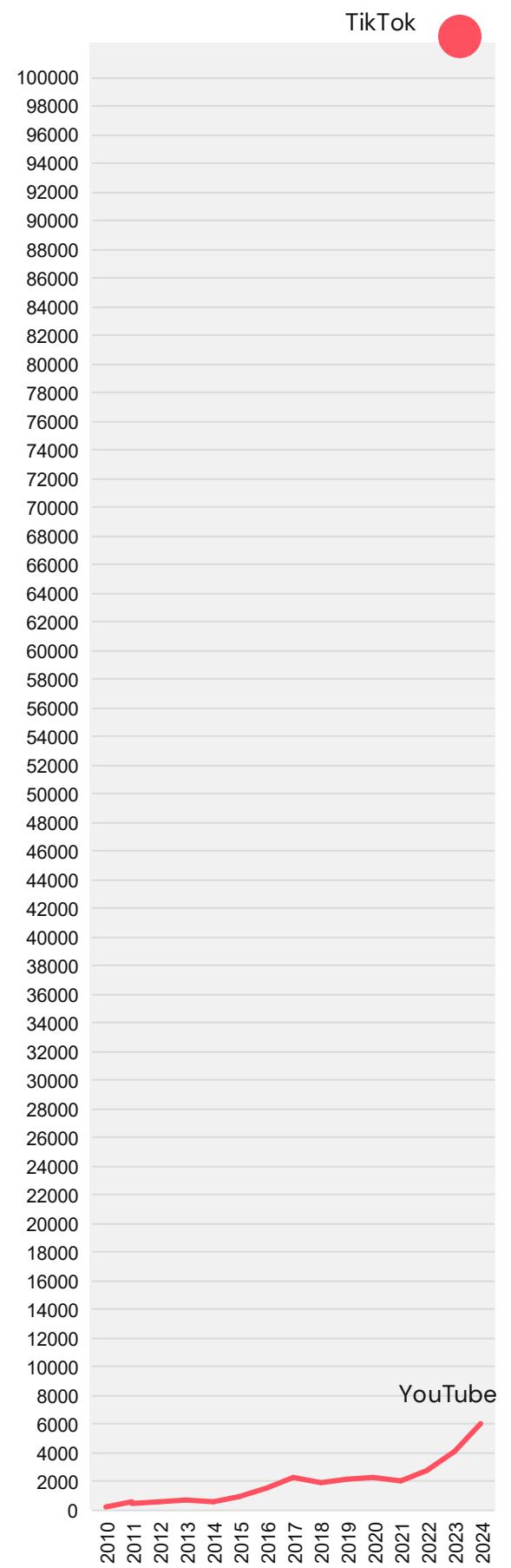
If we focus on TikTok, we observe a significant increase in the volume of data. Although we only have data going back to 2024, the figures show an average of over 100,000 registrations per user per year – and significantly more for many users. The most active users have registered up to 318,638 data points per year – solely from the videos they view.

This means that, on average, TikTok registers 17 times more data points than YouTube does for videos that have been started. In the case of the most active users, the difference may be up to 50 times greater. Interestingly, search data on TikTok is roughly on par with YouTube – around 300 searches per user per year. The figures clearly illustrate how different platforms generate different amounts of data about their users. In particular, TikTok's general short format and YouTube's *Shorts* show how new formats can result in a significant change in data collection.

WHAT DOES THIS MEAN?

The detailed behavioural data allows the platforms to map what users watch, when they watch it, and how long they engage. At the same time, this information can be used to continuously adjust and optimize content. This process functions as a testing and feedback system, in which the user's behaviour is constantly analysed and converted to new recommendations (see pages 57–58). It is not surprising that shorter and more numerous videos generate more data points. But, in addition to increasing retention, the enormous amounts of data also contribute to the platforms' marketing models and massive earnings from users. We will return to this topic later.

Average number of data registrations on videos



The logic of the Feed: In search of reward

As early as the 1930s and 1940s, psychologist B.F. Skinner established that rewards awarded in variable (as opposed to fixed) circumstances are effective in both generating and maintaining certain behaviours. What Skinner called *variable-ratio reinforcement* we now refer to as *variable reward* in reference to social media (Simple Psychology). The concept is that users receive unpredictable, fleeting rewards – in this case, entertaining content – and the user not knowing when the reward will come creates an incentive to keep going.

ONE-ARMED BANDIT

The shorter the content, the easier it is to watch a lot of it. We are familiar with this mechanism from the gaming industry, where, for example, slot machines require a low financial investment per game and offer the possibility of a large win if you are lucky. The games are also short, so you can quickly play another game if the previous one didn't pay off – what if the next game hits the jackpot? This mechanism is the same on social media. Even though the content is curated and tailored to the individual user, it feels random when something really good comes along, or when something misses the mark.

Both Instagram's *Explore Page* and TikTok's *For You Page* have the *pull to refresh* feature, which simply means that swiping down causes Instagram and TikTok's curation algorithms to update the page with new content. This is a very effective way to keep users engaged, as swiping down is a very natural and intuitive action for most people. YouTube has a similar feature, though not *pull to refresh*. Instead, the platform also fetches new content by opening and closing the platform – another feature that feels random.

Both the perceived randomness of the curated content and *pull to refresh* bear similarities to the one-armed bandits. The latter almost mimics the game, as the machine also shakes the bag and offers new content just like the machine's arm is pulled downwards. Then there is the similarity with the gaming industry in general: an endless pursuit of gain and dopamine release. The interesting thing is that it is not only the content that maintains the *scrolling* and thus the retention. It is just as much, if not more so, the excitement and hope that maybe, with a bit of luck, the next video will be the dopamine rush you are hoping for.

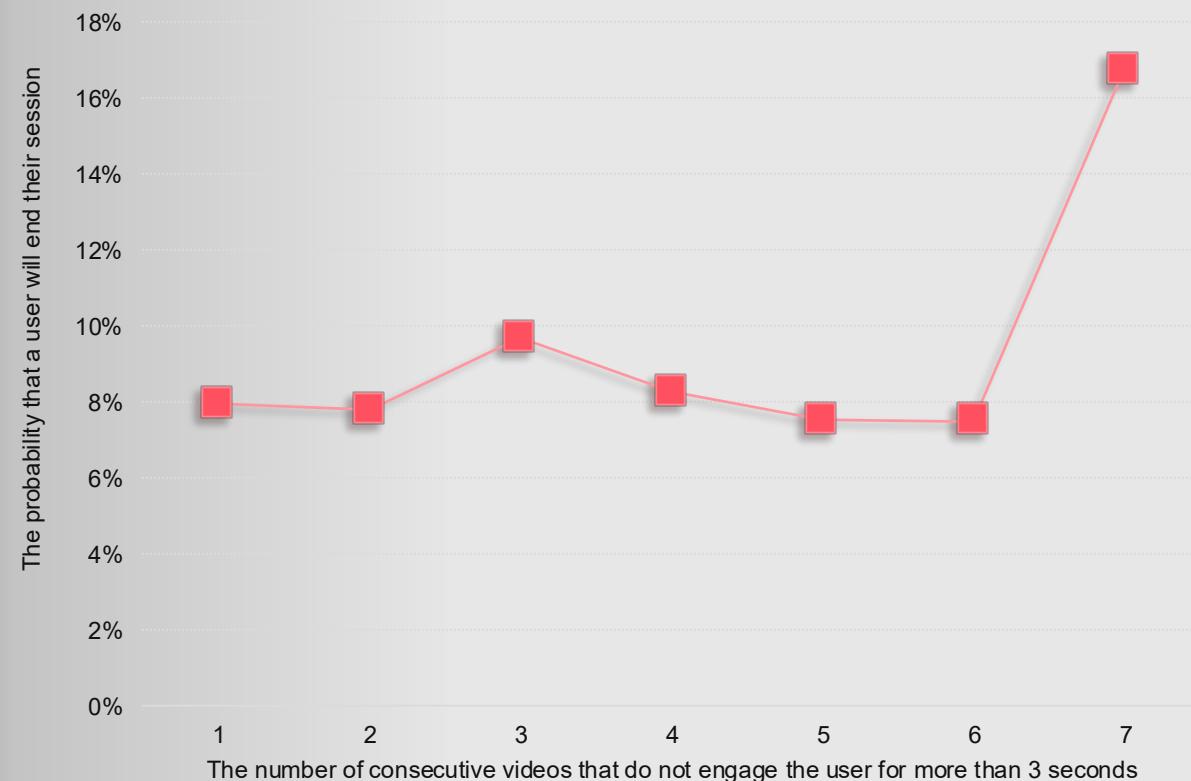
However, the cumulative price of both the one-armed bandit and social media's short form is not insignificant. Both can end up taking up large amounts of the individual's time, and perhaps even money.

SEVEN IS A MAGICAL NUMBER

As far as we know, no studies have yet been conducted that reveal the infrastructure of recommendation algorithms. We've tried though. By examining countless sessions from our data donations, we have calculated how many uninteresting videos TikTok can show users before those users break from the *feed*.

If a user watches three seconds or less of a video, we characterize that as 'uninteresting'. The figure below shows that the proportion of users who leave TikTok after one to six uninteresting videos is less than 10%. But if the seventh video

TikTok: The correlation between the number of "uninteresting" videos and the likelihood of a user closing the platform.



still fails to capture the attention, almost one in five users closes the platform. Insights such as these are constantly used to curate content and adjust the quantity and position of advertisements and other items in the feed.

This indicates how long the tech giants can prolong the pursuit without losing users. There is no doubt that they are constantly measuring such behavioural patterns, which inevitably vary greatly depending on how committed the users already are.

The logic of the Feed is influenced by many factors. In the next section, we have attempted to simplify the circular infrastructure.

Never-ending feedback loop

Behind the *feed*, the influencers, the advertisements and the screen, there is a digital infrastructure that enables the constant creation of engaging content that makes the platform attractive. We have already touched upon this infrastructure earlier in the report but will now give it a little more attention and expand on the carousel/loop in our individual feeds.

The illustration on the next page shows a simplified version of the five main elements of the tech giants' infrastructural feedback loop; i.e. the mechanism through which behaviour on a given social media platform sends feedback to the platform, which then becomes smarter and curates more relevant content for the relevant user. Successful curation can result in even more activity on the platform and further feedback – thus creating a self-perpetuating feedback loop.

FOR YOU PAGE

As we saw on the previous page, nothing is random, and yet it often seems that way. Your personal *feed* looks like no one else's. It is tailored to you based on the extensive, detailed observations of your behaviour that tech giants make every single day.

In addition to curated content, users also receive recommendations for new users to follow. How individual social media platforms calculate recommendations varies, but it may be based on other users whom the platform assumes are in your local network due to many mutual connections, or it may be popular creators whose content matches your interests. The aim is to increase each user's network, and the underlying logic is: The larger the network on the platform, the more users and content to interact with, and ultimately the greater the likelihood of spending more time on that particular platform.

Let's take a closer look at the circular infrastructure, with the personal *feed* as the central hub.

DATA COLLECTION

We start with data collection, which is a prerequisite for the infrastructure that facilitates social media functions and boosts retention. As with infrastructure in general, it facilitates other things happening, preferably efficiently and smoothly. In order to curate content for each individual user that matches their interests, media platforms need data. The data is collected from each and every one of the user's

actions. This includes everything from the type of content a user views, how the user interacts with the platform and what is shared with other users, to scrolling behaviour, search words and the specific amount of time spent on each piece of content.

By measuring the time spent viewing a video, social media platforms get a clear insight into what captures users' attention and what does not. It is impossible to keep the carousel running without this data. As we well know, this is the currency users pay with when they use the tech giants' popular platforms.

This is how social media has worked for almost a decade. However, one of the important differences is the transition to short form, which enables the collection of far more metrics than from longer videos, from which one consequently gets significantly fewer measurements and metrics per minute.

TESTING & FEEDBACK

This behavioural data trains the media's algorithms in what is referred to as a *feedback loop*.

Data is collected from millions of users every day, enabling tech giants to create a massive *testing and feedback loop* where the many videos that are constantly uploaded are measured in terms of how good they are at capturing attention and whether they deserve to be pushed to the front by curation algorithms. This also applies to negative feedback, i.e. information about everything a user swipes away from or does not view to the end.

There are differences in how this works in practice for individual platforms – i.e. what carries the most weight in terms of *performance*? Is it *likes* or the number of seconds the user views the video?

The combined collected data teaches the algorithms what does and does not work. At the platform level, this gives the platforms insight into what works and performs well on a global scale, across millions of users. In other words, what sticks. If social media platforms manage to increase retention, the amount of data will also increase, and thus more test data will enter the constant *feedback loop*.

CURATION

What is commonly referred to as "the algorithm" is a system of curation algorithms that collectively analyse millions of videos to identify those that are most appropriate to present to each individual user. There are many calculations behind these analyses (which are inaccessible to us), but basically, content is ranked according to how much the algorithms think each user is likely to view a video to the end or interact with it.

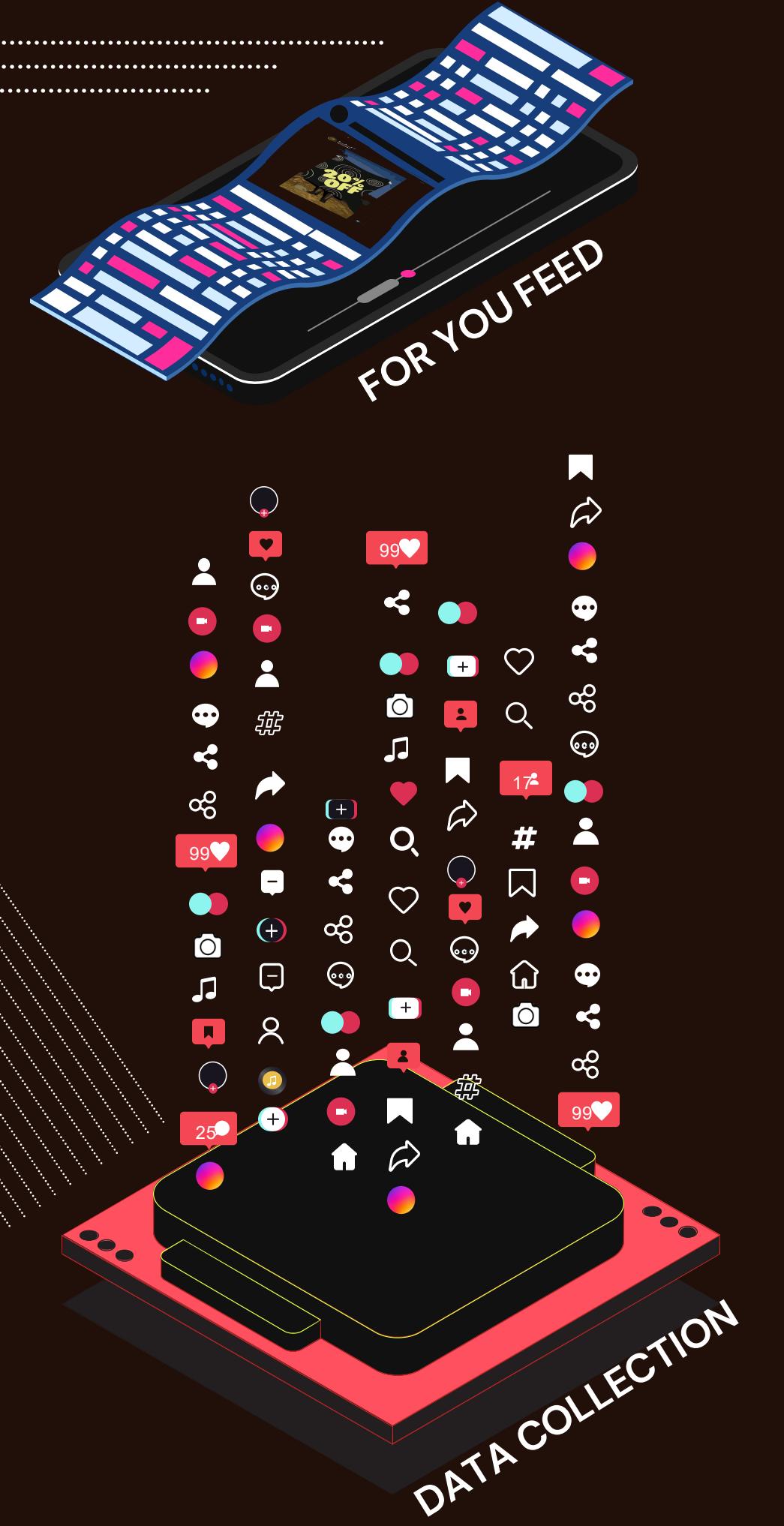
It's an endless process of selecting the most suitable content. Partly based on what will capture and retain the user's attention enough for them to continue using the platform. Partly based on which advertisements, i.e. one of the platform's primary sources of income, should be presented to this particular user, and in an appropriate quantity so that does not stop the user from using the platform.

It is these curation algorithms that control the *feed* and decide what the next video in the session shall be. Curation algorithms will also be very important when we later analyse harmful content. When and the extent to which it appears in young people's feeds is also determined by data (see the visualisation on the next page).

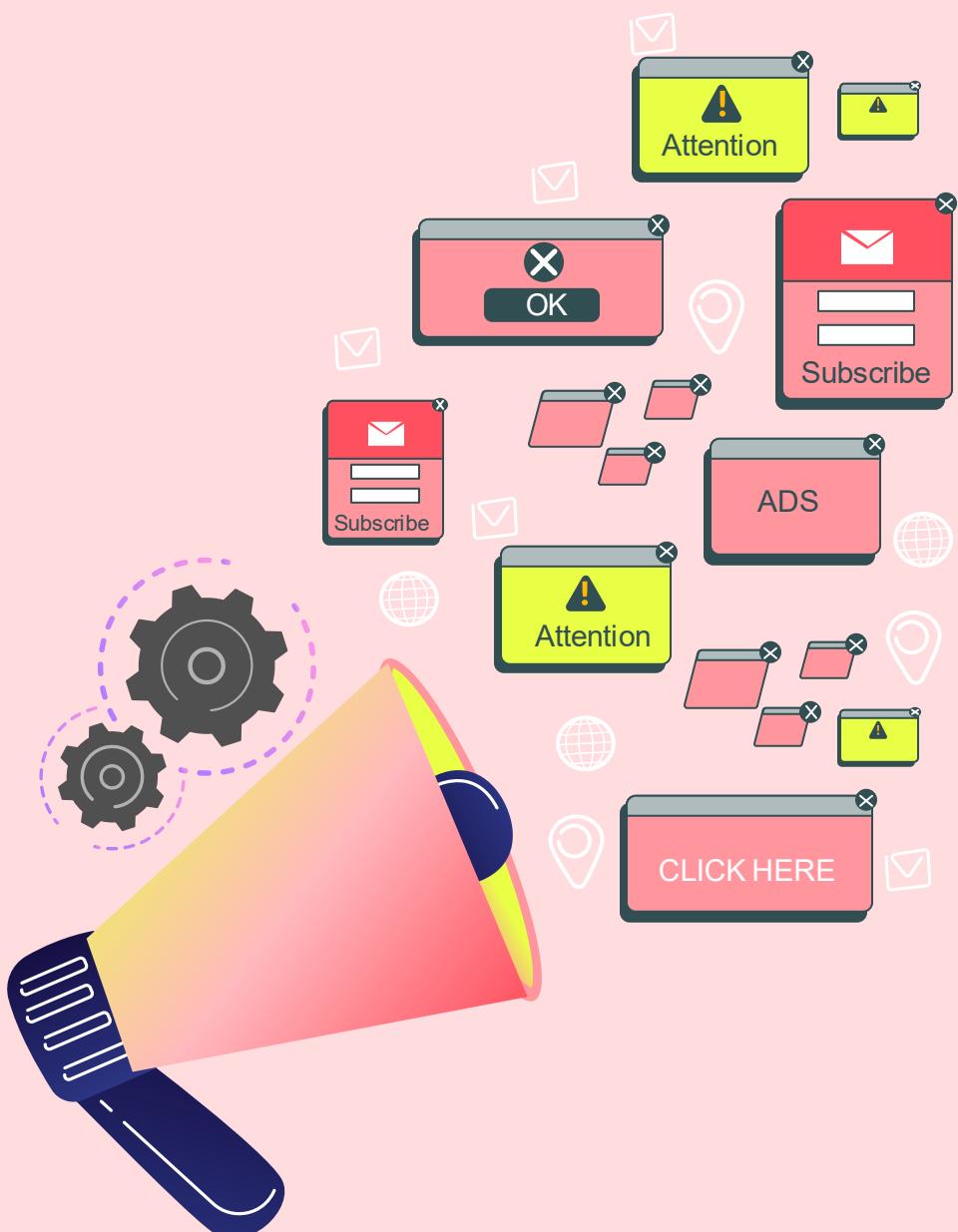
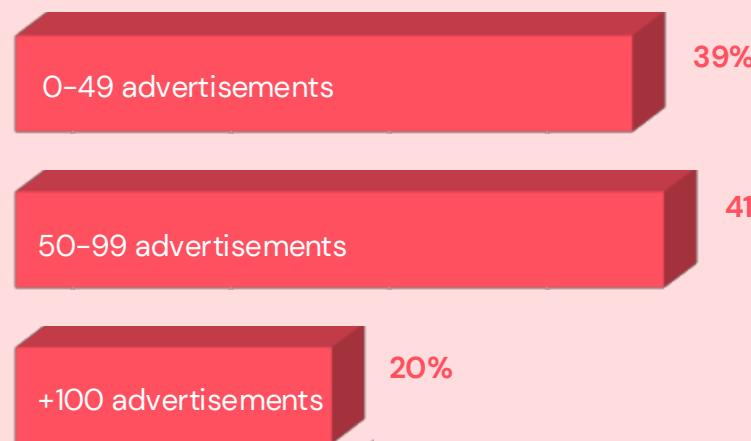
CURATING ALGORITHM



TESTING & FEEDBACK LOOP



Distribution of daily advertisements
Percentage of users broken down by daily exposure to advertisements



CONTENT CREATORS

Behind everything are the content creators: Brands, creators, news channels, etc. that produce content that generates new data in the *testing and feedback loop*. Their content is first trialled with a few users, and if it *performs well*, it is distributed to more and more people. It has proven to be an effective method for capturing and retaining user interest.

User data is also provided to content creators in the form of various *analytic dashboards*, which provide detailed descriptions of which users certain videos perform well with, as well as data on which parts of the video perform well and when users swipe forward – an in-depth insight that informs the creator about areas for improvement.

Content creators are in constant competition with each other. Few can maintain a constant production rate that can satisfy the curation algorithms. Those brands that can afford it pay for advertising space or enter into paid advertising partnerships with professional creators who have cracked the code of how to capture the attention of the target audience. The rest must produce content and hope that their videos garner enough attention.

WORLDWIDE MARKETING CENTRE

Social media marketing is a complex issue that will not be fully explored in this report. One distinction worth highlighting, however, is the distinction between paid and organic content on the platforms.

As previously mentioned, the paid content reaches the creator's desired target group. The bigger the budget, the greater the demand for the creator's *reach*. In contrast, the reach of organic content depends on how well it *performs* among followers and on the platform in general.

In recent years, TikTok, Instagram and YouTube have increasingly begun to make data available to *content creators* and popular brands. For example, TikTok has the *Creator Rewards Programme*, *TikTok Creator Hub* and *TikTok For Business* to name just a few examples of platforms that offer insights and tools to creators and brands, focussing on different areas; e.g. some for the creation of organic content, others for paid marketing.

This means that insights and tools are made available across organic and paid content, giving *creators* and brands better opportunities to reach and entertain their followers in the best possible way.

Thus, key components of social media infrastructure are both the collection and sale of user data – for the commercial marketing of companies and products and for the development of tools that optimise the production of marketed content (see the illustration on previous page).

Let's talk money

The three social media platforms we are examining are "big business". Although they have many different revenue streams, advertising revenue is still crucial when dealing with media that is designed to capture and retain users' attention – and which is provided "free of charge" in exchange for users' time and data.

They sell the retention they are so good at creating to brands and others who want to show their content to specific target groups on a large scale.

In 2024, TikTok had a global turnover of DKK 117 billion, Instagram DKK 186 billion, and YouTube DKK 230 billion. These are astronomical amounts. But how much of this money comes from the data donors in this study? And how much is earned from Danish youth?

That question is difficult to answer, as the required data has not been shared. In this section, we will attempt to estimate this using a transparent, *bottom-up* method based on young people's actual encounters with content and advertisements in their feeds, based on their donation data.

DATA & ASSUMPTIONS

To make the calculation, we use the donors' TikTok feeds as a starting point to estimate how many videos they watch per day and per year:

- Videos per day: 381
- Videos per year: 138,649

Previous studies have shown that, on average, users encounter an *ad load* (proportion of advertisements in the feed) of approximately 20%. In our study, we searched for the words "advertisement" or "ad" in video descriptions and found that 18% of videos contain one of the two words on TikTok. This estimate is consistent with our qualitative review of donor feeds and provides us with the average advertising exposure:

- Advertisements per day: 68
- Advertisements per year: 24,956

There is probably much more advertising content than we have included, so the statement that young people only see 68 advertisements a day is probably quite conservative.

CALCULATION METHOD

We estimate annual advertising revenue per youth using eCPM, a standard measure of how much is paid for 1,000 impressions of an advertisement. Once again, we must point out that this calculation method is not exhaustive, as TikTok has many revenue channels. However, this is considered sufficient for our purpose, which is to obtain an estimate of the platforms' earnings from young people.

To account for uncertainty in price levels (eCPM), we establish a minimum and maximum calculation. Both are based on the same number of paid views. The minimum calculation is based on an eCPM of DKK 19, while the maximum calculation is based on an eCPM of DKK 40.2. These eCPM levels are within a realistic range.²

The calculations produce a range of a minimum of DKK 482 per user per year, and a maximum of DKK 1,020 per user per year.

TikTok earns between DKK 482 and 1,020 per year per data donor in the study

Even though advertisers pay as little as DKK 0.01 to display an advertisement, TikTok has created an infrastructure that really pays off.

In summary, the constant optimisation of algorithms, large amounts of data and, not least, the new short video formats make it possible to offer a marketing hub where anyone who can afford it can have their content displayed through a myriad of short videos that quickly replace each other. Not only have we become accustomed to this infrastructure, but we also feel satisfied when our pursuit of gratification pays off.

2. Transparency is not easily achievable in this area, but after in-depth research, we rely on the same source as Statista: the report, The Performance Marketing Guide to TikTok Ads Cost, by Gupta Media (2025).

Chapter 5

Harmful content

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The definition of harmful content and our approach to analysing it

In this final chapter, we will move on from the infrastructure, design and retention elements. We will now move on to analysing the content presented in the feed: its characteristics, the creators, and when it becomes potentially harmful. Initially however, we will take a step back and lay the foundations. How do we even define harmful content, and what data and methods have we use to examine the content? From a Danish perspective, there are several possible definitions and analysis frameworks. In general, we are guided by the Data Ethics Council which, in a consultation document of 2024, defines harmful content as follows:

"Harmful content is content that harms a person. Content means any online content, including text, images, audio, video and interactive elements. Harm is understood as an impairment of a person's well-being; for example, exposure to the content leads to physical pain, mental suffering, financial loss, reduced self-esteem, social exclusion, or loss of physical, social, or cognitive skills."

– Danish Data Ethics Council

In other words, the content we classify as harmful is content that we believe can cause mental or physical pain, inflict financial consequences or reduce self-esteem.

Although the definition also specifies what we can characterise as content (text, images, audio, video and interactive elements), there is an important aspect missing in terms of investigating the negative impact of content on the user.

When working with retention mechanisms, we can see that volume plays a major role. This means the number of videos users are exposed to.

CUMULATIVE EFFECT

The cumulative effect is a concept we use to broaden our understanding of harmful content. A video depicting a beheading or rape will probably always be categorised as harmful, as we expect it to have a negative impact on the viewer in some form – in terms of mental health for example. On the other hand, videos featuring a popular influencer's daily workout routine are not as harmful as a stand-alone video. On the contrary, they can inspire and entertain.

However, if the entire feed is filled with ultra-thin women using various AI filters to optimize their appearance, lighting and sound, this can negatively affect the viewer. For instance, this could have a harmful cumulative effect in terms of self-esteem or health issues. There is an obvious connection here to retention mechanisms, which can have a detrimental effect. This is especially true if a user is exposed to content with a harmful cumulative effect. According to the Children's Council, this particularly applies if the addictive design originates from game design or gambling – or if it uses reward systems that can cause financial and emotional harm to the child. These mechanisms can also result in inappropriate habits, compulsive gambling and addiction (Children's Council).

It is therefore not enough to examine and identify the individual videos that match the definition on the left. Our analysis is based on a broad understanding of what data may be relevant to examine when mapping harmful content. To systemise the analysis, we work with different types of content, which are presented on the next page.

HARMFUL TO ONE, HARMLESS TO ANOTHER...

Content types are our central unit of analysis, but before proceeding with the analysis, we will explore an important consideration regarding the target audience. Every person is different from the next, and exposure to the same content may be harmful to some and not to others. For example, sexual content as a content type will be more harmful to a 7-year-old than to a 17-year-old. We cannot therefore determine the exact scope of harmful content, as it always depends on the recipient's resources and context.

OUR APPROACH

There are still no standardised methods for mapping harmful content, and it will never be possible to create a completely 'true' picture. There are simply no two feeds or two users that are alike.

Our approach involves two different methods, each of which informs the other and allows us to look at overall trends and understand the content and curation of specific harmful videos.

We first performed a qualitative content coding of 1,000 randomly selected videos from TikTok and YouTube. In the qualitative coding, we review the 1,000 videos and categorise them based on theme, creator, language and whether or not they are potentially harmful. Although this is a relatively small sample, it provides a picture of what the content in the videos is about and makes it possible to select representative examples from the narratives that recur on the platform in question.

Several organisations, including the Data Ethics Council, the Children's Council and Digitalt Ansvar [Digital Responsibility], point out that the concept of harmful content is best operationalised by including a classification of content types. This could be a categorisation based on theme, messages, formats or effects. For example, Digitalt Ansvar's categories work with a content dichotomy which distinguishes illegal from harmful, and a third category that is both illegal and harmful (Analysis & Tal). Other analyses use categories such as offences, extreme content, fraud or misinformation (Analysis & Tal).

For this project, we chose to work with a thematic categorisation of 14 themes, some of which were defined in advance, and others added along the way.

As a further step, session analyses were conducted to track some of the harmful content young people have seen during a single session, i.e. a continuous period during which they have been on the media platform. We do this to map how harmful content appears in the feed and how it relates to other content. We also look at which creators account for most of the content in the feed. We do this by viewing harmful content as a complex issue that must necessarily be viewed from a network perspective, where quantity, repetition and bias can combine to be harmful to the children and young people who are exposed to it.

CONTENT CATEGORIES

Let's first look at the most prevalent content.

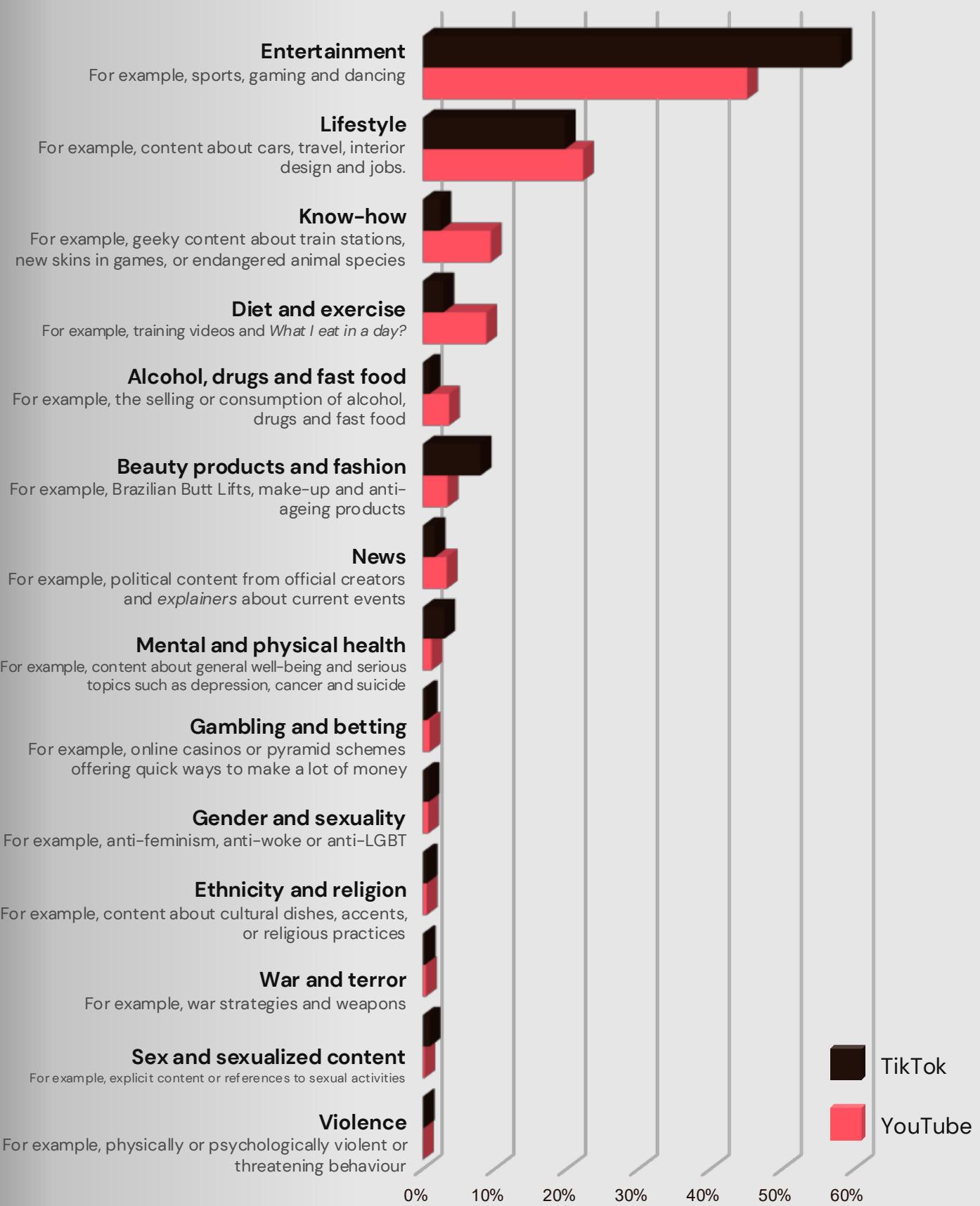
Entertainment and lifestyle content make up most of the feed on both platforms. Entertainment is more popular on TikTok, totalling 58%. Entertainment is a broad category that includes everything from dance videos to sports content and gaming. It is not surprising that the young people we have spoken to throughout the project also point out that their time on TikTok is largely due to the fun and entertaining content that they incorporate into their physical, social lives – e.g. with friends at school.

The **lifestyle theme** covers aspects of our everyday lives. For example, content about cars, travel, interior design and work. The vast majority of videos in this category are from brands promoting their products. The next-largest themes show the biggest differences between YouTube and TikTok. There is a lot of content on YouTube about **diet, exercise and know-how**. The **beauty** theme is far more popular on TikTok. The know-how theme on YouTube is an old classic that has always characterised the platform, covering everything from train stations and new skins (virtual items) in games to endangered animal species and historical events.

Diet, exercise and beauty appeal to both boys and girls – we will return to the potentially harmful content in these categories on page 79. The more explicitly harmful videos are found in the more minor themes of **violence, gender & sexuality, gambling, and ethnicity & religion** – we will return to this later (page 73).

All content is also categorized by language. Speech carries the most weight here, and if the content does not include speech, we categorise it based on captions or hashtags. If all of these are absent, categorisation is based on the creator. This is usually evident in the comments section or profile, which is usually in the local language, indicating the linguistic origin of the content. English is by far the most dominant language in feeds on both YouTube and TikTok, accounting for 84% and 72% respectively.

The most popular content categories



Each bar indicates the proportion of videos within each theme. The figures are based on the qualitative content coding of 1,000 videos from both TikTok and YouTube.

Who creates the content?

On the right are the results of the content coding of 1,000 videos on YouTube and TikTok. The pie charts show the proportion of which types of creators occupy the most space on the platforms.

Over half of the content on TikTok is created by ordinary users – i.e. profiles that do not have large followings. 30% of the content is made by *influencers* and 16% by specific brands. We see a somewhat different picture on YouTube. Here, *influencers* make up 61% of the feed and brands make up 34%, leaving only 5% of the feed for lesser-known YouTube profiles.

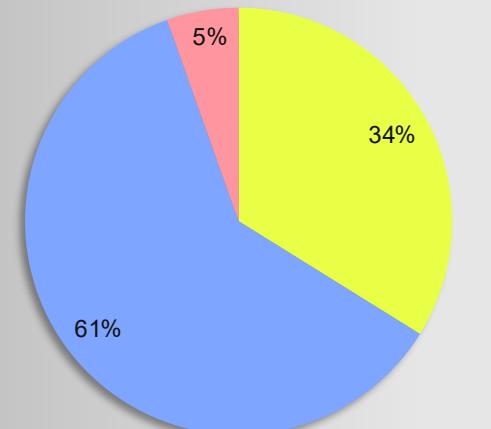
Throughout its history, YouTube has offered users the opportunity to *subscribe* to profiles whose content they like. It has encouraged them to do so through its design and other features. This is also reflected in the categorisation, where *influencers* – channels with large followings – feature most prominently compared to brands and ordinary users.

In contrast, the figures show how users on TikTok are less likely to be presented with content from profiles they already know and follow. On TikTok, users get a substantial amount of content from users they don't know or follow, because TikTok's curation algorithms assess that this is content that will entertain the user and retain their attention – rather than expecting users to value loyalty over entertainment.

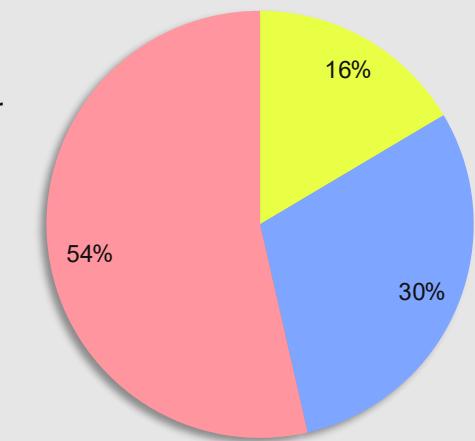
It is also significant that our donation data from TikTok includes content created by 140,366 different profiles. If we drill down into the profiles, only 1% of them appear more than 10 times in the dataset. What remains is a core of 1,400 profiles, which constitute the recurring material in the feed and which the young people become familiar with.

Creator types creating the most content

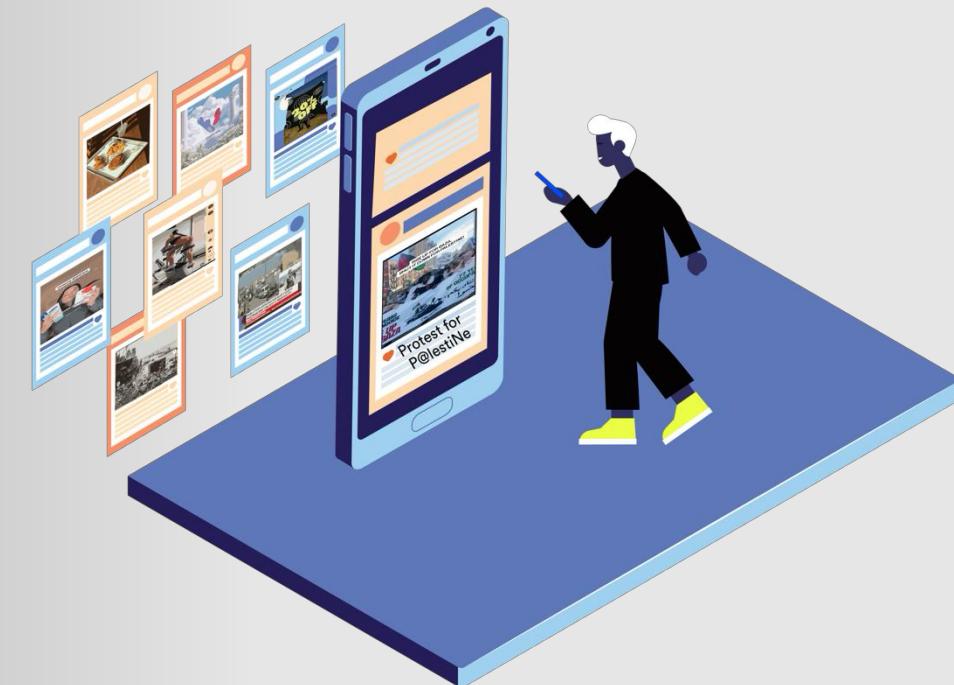
The figures indicate the proportion of videos created by brands, *influencers* or ordinary users. The figures are based on the qualitative content coding of 1,000 videos from both TikTok and YouTube.



YouTube



TikTok



On the right we see the 33 profiles with the most videos in our TikTok data. The graph is ranked by the number of videos appearing in our dataset. The list primarily consists of brands about fashion, training, fast food and entertainment services.

Together, the 33 profiles account for 7.5% of the young people's feed. That's equivalent to every 13th video. We suspect that many of these appear as paid content, which is supported by the bars on the far right, which show average retention rates.

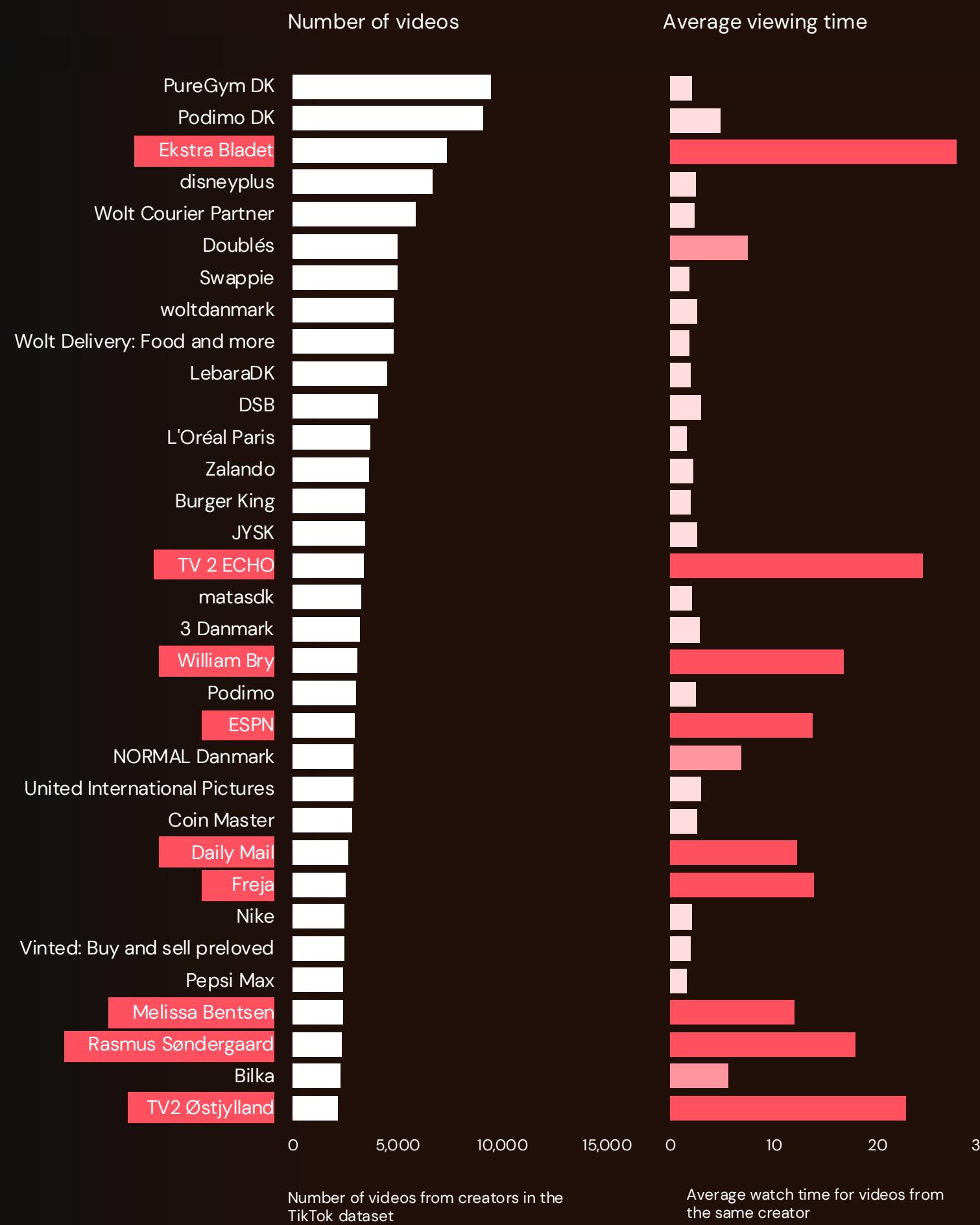
Most brands have a low retention rate, meaning users don't watch the video to the end, but quickly scroll on. However, if we look at the creators who manage to retain the user's attention, we see a new and surprising trend.

There are a total of five news channels and four Danish influencers among the 33 profiles with the most videos in our data, all of which have a significantly longer retention rate than the brands. In terms of influencers, young people encounter William Bry, Freja, Melissa Bentsen, and Rasmus Søndergaard, among others – some of the biggest names in Denmark, which is to be expected. A review of their videos shows that they often enter into advertising partnerships with brands.

We also see that news sites such as Ekstra Bladet, TV 2 Echo and TV2 Østjylland are also on the list. Not all news media outlets are doing well on TikTok, but some have managed to crack the code and produce news in a format that can be adapted to the medium, in terms of perspectives, editing, pacing, graphics, and people in front of the camera.

What the 33 profiles have in common is that they manage to stay relevant and current by producing content frequently and consistently. Among the 33 profiles, all brands, influencers and news channels manage to produce an average of one video per day. It can be very demanding to produce content so often and to consistently push it out to so many users. In order to compete with the vast amount of content that users could otherwise view, the level of commitment is thus high.

To succeed, these videos must either be engaging in themselves, which we see is the case with influencers and news channels, or TikTok's payment solutions can be utilised, allowing users to pay for additional space and marketing in the feed.



What characterizes harmful content?

As with the other categories in the content coding, we have assessed each video in isolation, i.e. whether it appears harmful in itself. We will later look at the cumulative potential of the content categories and the extent to which they are represented in the two samples. Content coding showed us that, among the 1,000 YouTube videos, 1.8% contained harmful content. The number was slightly higher on TikTok at 2%.

As we defined at the beginning, harmful content is difficult to formalise. We have coded each video as a stand-alone piece of content that, in itself, can have a harmful effect on young people. This means that these videos must contain explicitly harmful content – and not something that must be read between the lines or be related to the beliefs or character of the user posting it.

The content we found across YouTube and TikTok is similar in both form and themes. We cannot conclude from this study that there are major differences in exposure and types of harmful content on the two platforms. On both platforms, harmful content is spread across virtually all theme categories, but there are still some features that recur across several videos:

Humour plays a big role in communication and retention in general on these social media platforms, and the same is true when it comes to harmful content. This could be unexpected music tracks accompanying a fight, or funny sketches telling boys that Asian women make better girlfriends because they are not demanding.

Several harmful videos feature **pastiche**. This is a mixing of existing material that creates a chaotic whole where, for example, homophobic comments are almost drowned out by the dynamic nature of the content. This might be a recording of a video game with clips of politicians inserted onto the screen as dressed-up dolls, while an AI-generated voice-over mimics the politicians having a homophobic conversation. There is a lot to take in, both visually and aurally. The voices may also be recognisable, and the overall context becomes so chaotic that the homophobic message is almost hidden or loses its impact. This could also be an old, culturally iconic clip that takes on a new, offensive meaning through an offensive voice-over or caption superimposed over the clip itself.

Harmful content performs better than non-harmful

We also see that the videos we have categorised as potentially harmful have more interactions on YouTube compared to videos that do not contain harmful content. On average, harmful content receives 541,000 likes, while non-harmful content receives an average of 289,000 likes. The same applies to the number of views, which averages 9.4 million views for videos with harmful content and 8.4 million views for non-harmful.

On YouTube, videos with potentially harmful content are also longer on average. Harmful videos last an average of 4.3 minutes, while non-harmful videos last 2.4 minutes.

Potentially harmful videos have an average *attention metric* of 0.8, which means that young people watch the videos to 80% completion. This may be due to their sensational value. As we will see shortly, harmful videos are often dropped into a feed that is otherwise populated by all sorts of other topics. In other words, there is often an element of surprise that can help retain the user.

They appear in the feed when least expected

A significant portion of the explicitly harmful content that donation users have seen has been spontaneously recorded in connection with an event, such as an assault in the city. Many users will automatically see videos like these because the curation algorithms register this as content that performs well. This means that they are shared widely and receive comments, views, etc. As a result, harmful content quickly gains traction – facilitated by the platform itself.

It is this dynamic, coupled with the lack of emphasis on human moderation, that allows harmful *live* events to spread like wildfire.

Most recently, we saw this in connection with the murder of Charlie Kirk, which spread so quickly on social media that the Children's Hotline experienced an increase in calls about that particular murder, because children and young people had seen it on social media, often without having chosen to, and were naturally affected by it.

Social media platforms test the content in the aforementioned feedback loop. If, like many others, you find yourself captivated by extremely violent videos, TikTok can then capitalise on your attention and insert a Wolt advertisement as a follow-up. That's what happens when the marketplace is the main source of income.

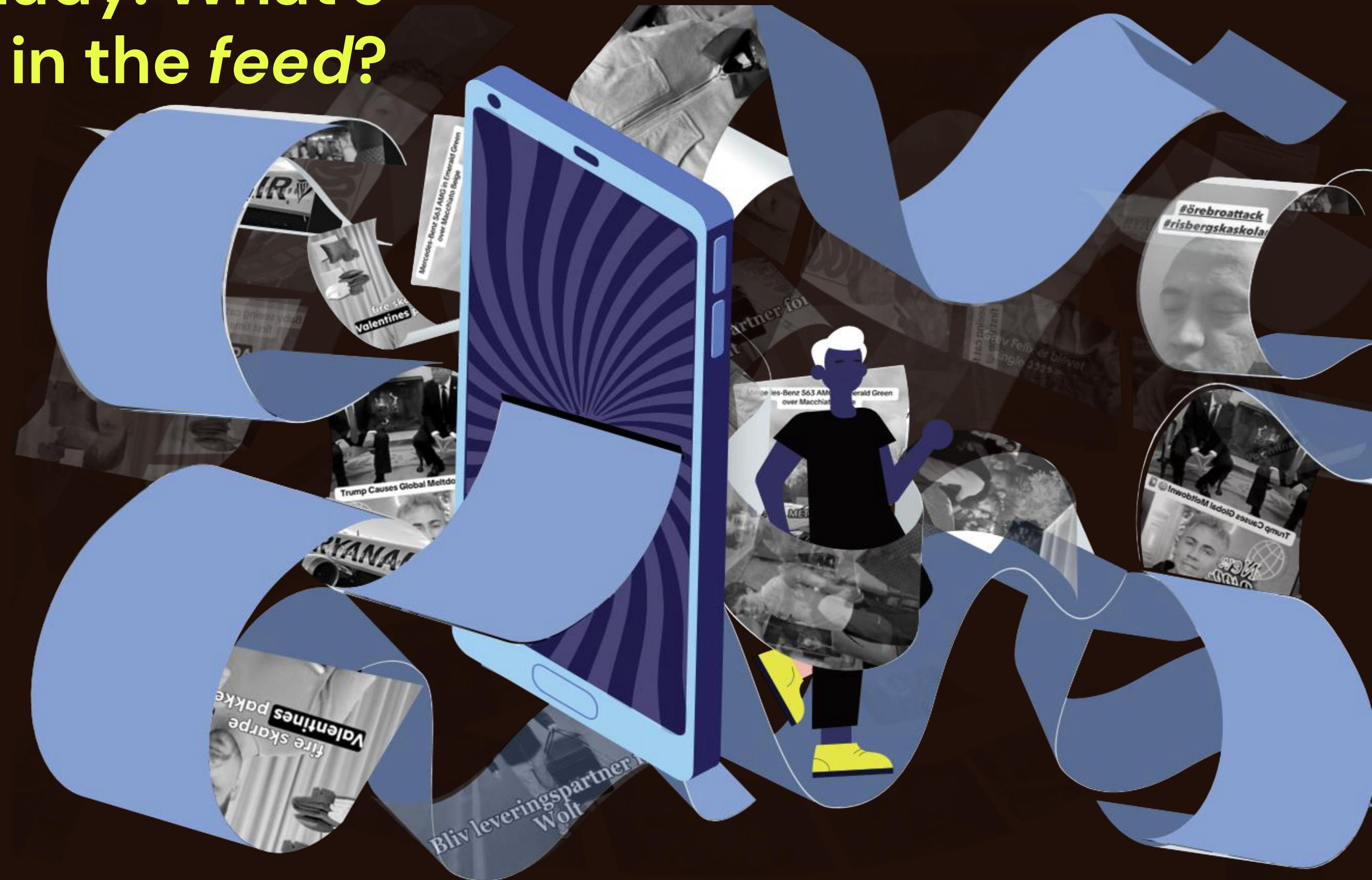
Technically, there is nothing to prevent human moderation of harmful content, thereby preventing it from spreading, but this would make the testing and feedback loop more expensive and significantly slower. A competing social media outlet that opts out of this will therefore have an advantage in terms of capturing users' attention and being first to push the wildest videos.

To investigate when and how this kind of content reaches young people, we will, in the next section, review a selected 20-minute TikTok session of a 16-year-old data donor.



harmful content on TikTok

Case study: What's hidden in the feed?



Milo
16 years old

5 February 2025, 14:46

This is a 20-minute session in which Milo manages to watch 82 videos, including videos about or featuring Count Felix, a school shooting, Snoop Dogg, Donald Trump, Alex Vanopslagh, dancing and lots of adverts.

The *feed* IRL: School shootings and violence intertwined with advertising and entertainment

We conclude our analysis of harmful content with an illustrative example from a single young person in our dataset. This affords an insight into what an actual *feed* looks like, which videos young people spend time viewing and which ones they *scroll* past – as well as the content TikTok issues warnings against. We will call this young person Milo who was 16 years old at the time.

On 5 May 2025 at 2:46 p.m., Milo took his mobile phone from his pocket and began scrolling through videos. It had been a little over an hour since he was last on TikTok. Over the next 18 minutes, Milo scrolled through and viewed 82 videos. On average, this amounts to 13 seconds per video. However, not all videos captured his attention.

The session began with an entertainment video in which Milo watched a dance stunt by Klaudija. The short six-second video was viewed twice before he moved on. It has 24 million views worldwide. This is followed by an advertising collaboration between Humble Barbers and DitUr, but even though the advertisement is hidden behind humour and everyday images, Milo doesn't give it more than three seconds before *scrolling* on. The next video is a news item from TV2 Echo that Milo finds interesting. It's about Count Felix becoming single. It's one minute long and he watches it all the way to the end.



This pattern of entertainment and advertising is repeated throughout the rest of the session. The entertainment consists of videos featuring dancing, music and sketches, while the advertisements are for items such as shoes, clothing and gym memberships. However, the pattern is broken by videos that stick out.

After three minutes of more commercials and entertainment, Milo comes across a video that catches his attention.

The video is from a school shooting that took place the day before in Örebro, Sweden, where 35-year-old Rickard Anderson killed ten people and wounded six others before taking his own life. The video is of a different character than the ones Milo has watched so far. It is recorded in a toilet where one of the school students is hiding, while gunshots and noise can be heard on the other side of the door. The video lasts 12 seconds and is watched to the end. It had been seen by

8 million other users. This video is followed by a now deleted video, the content of which we cannot see, but which also catches Milo's attention.

Then an advertisement for pillows appears, which gets no more than two seconds of Milo's attention.

After another two minutes and 11 videos, we come across the first video to which TikTok attaches the following warning:

This post may not be comfortable for some audiences. This video turns out to be an advertisement for Visa's Cashback. The rapid-cut video and relatively hidden advertisement are rewarded with ten seconds of attention from Milo, until the point in the video where it becomes clear that it is an advertisement. He then *swiped* on.

After two minutes and ten videos of advertisements and entertainment, Milo comes across a surveillance video from a shopping centre in which a fight is taking place. This video also comes with the warning: ***This post may not be comfortable for some audiences***. He watches it twice.

After a further 17 advertisement and entertainment videos, Milo comes across a 40-second video, which he watches to the end. This one comes with a more prominent warning from TikTok: **disclaimer the actions in this video are performed by professionals or supervised by professionals do not attempt.** The video is a recording of a marching band playing music.

Milo then begins to *scroll* a little faster. The next 18 videos get no more than a second of attention each. Among these is another surveillance video, but this time of a gang shooting in Belgium. At this point, Milo is not interested and is *scrolling* past. He also *scrolls* past two politicians who are trying to gain his

attention: Alex Vanopslagh, who opposes the war tax, and former minister and current director of the Danish Brewers' Association, Nick Hækkerup, who states in a podcast that alcohol can of course cause problems, but that young people should be allowed to live their lives and test their limits.

We are now into the last two minutes and ten videos of the session. Ed Sheeran captures Milo's attention for ten seconds, and influencer *#xeniagarver_* managed to capture Milo's attention for 14 seconds with an advertising collaboration with Saxo.com.

The session ends with a calm baby and cat video, which he watches twice, and a music video where everyone sings at full volume: Do Re Mi Faaa Faaaaaaaaaaaaaa, and then Milo's session is over for the time being.

It is 3:14 p.m. Just 15 minutes later, Milo takes his phone out of his pocket again and begins a new session.

The content in this example is not representative of all sessions. However, the mixture of entertainment, advertising and other, sometimes more violent, videos is a recurring pattern. Young people are therefore exposed to videos with potentially harmful content in their routine, everyday TikTok *scrolls*. Moreover, warnings are relatively often displayed before a video begins, but there does not seem to be a pattern to which videos the platform attaches a warning by.

The school shooting video is an example of content we have categorized as potentially harmful that does not come with an official warning. This contrasts with the fact that there is a warning attached to a marching band playing music.

Harmful content has taken on a new form and its cumulative effect is particularly visible

As previously described, we are looking specifically at TikTok, but this applies to virtually all other social media platforms as well: i.e. the feed quickly fills up content that catches our attention.

This often means videos that are not necessarily harmful in themselves, but which in large quantities can be harmful based on the definition that it can impair young people's self-esteem and health. On the right-hand side, you can see a small selection of workout videos on TikTok offering advice from men who train seven days a week, follow extreme diets, with the attitude that you must pull yourself together if you want to achieve results. In other words, the message is that it's your own fault if you don't get the look you want. There is also content featuring young men who are dissatisfied with 'skinny wrists' and which also promotes an extremely well-trained and muscular male ideal. We have not categorised such videos as harmful – unless they explicitly encourage, for example, actions that are objectively harmful to users' health.

We see the same thing about ideals of femininity. These are not new, but on TikTok, where young people watch up to 3,000 videos a day, they can come to seem like a universal benchmark for beauty and thus affect users' self-esteem and possibly physical health.

It is impossible to conclude definitively how much harmful content there is in the feeds of our donated data, but we can see from our content coding that the themes of fitness and beauty feature heavily.

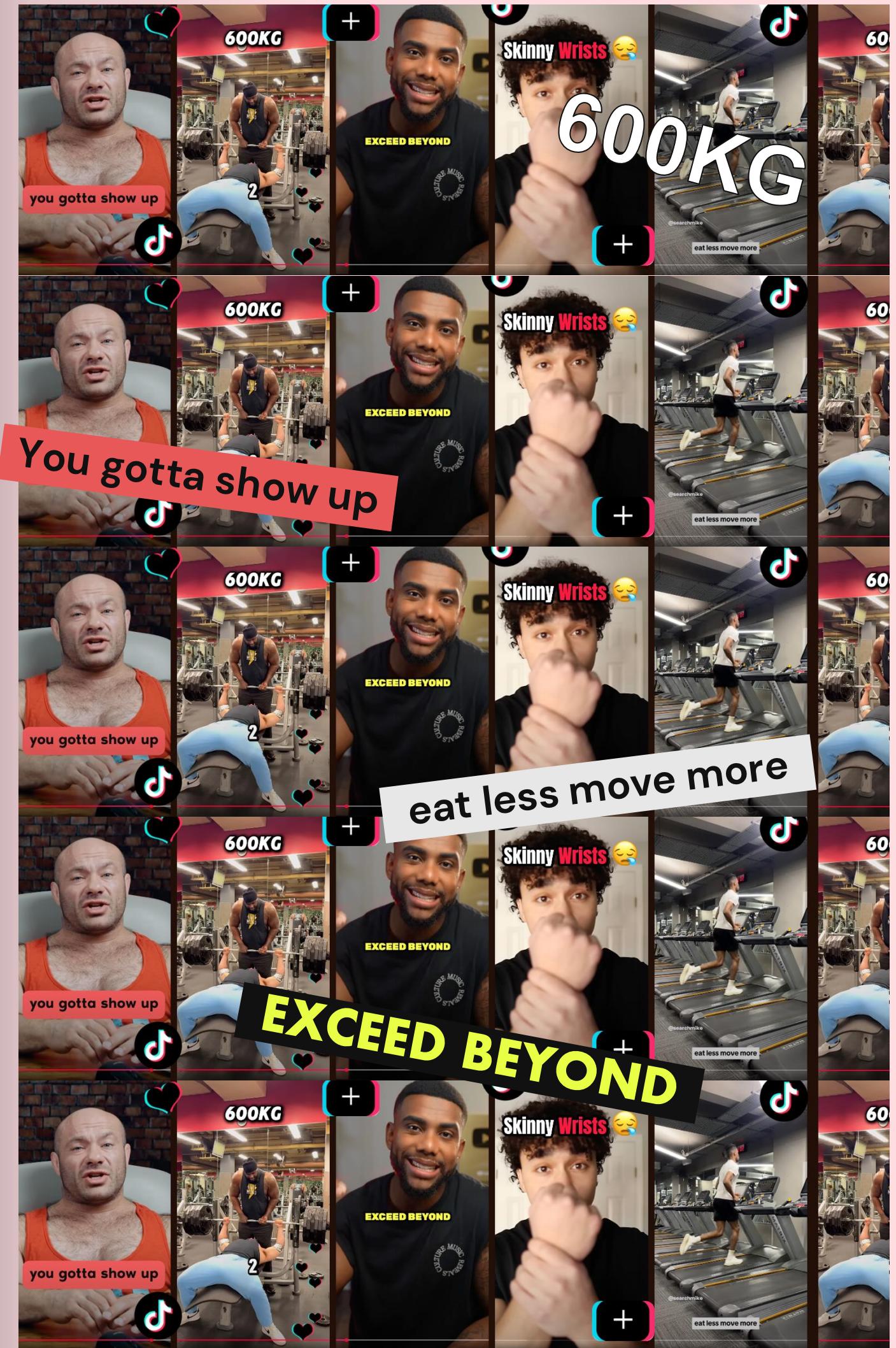
We can conclude that this massive exposure comes with a risk of harmful effects on young people.

WHERE DOES RESPONSIBILITY LIE?

Once again, we must ask ourselves where responsibility lies and who should be responsible for any monitoring. Are social media companies simply platforms that provide an audience for sales content? Or are they, like all other Danish media outlets, obliged to moderate?

Should young people take responsibility for their own behaviour? Or are the adults around young people responsible for implementing preventive and therapeutic measures? And finally, what is the role of politicians in this?

We don't know where responsibility lies, but we hope that this report provides food for thought and perhaps some ideas on how we can better understand and address retention and young people's exposure to harmful content going forward.



Analyse & Tal

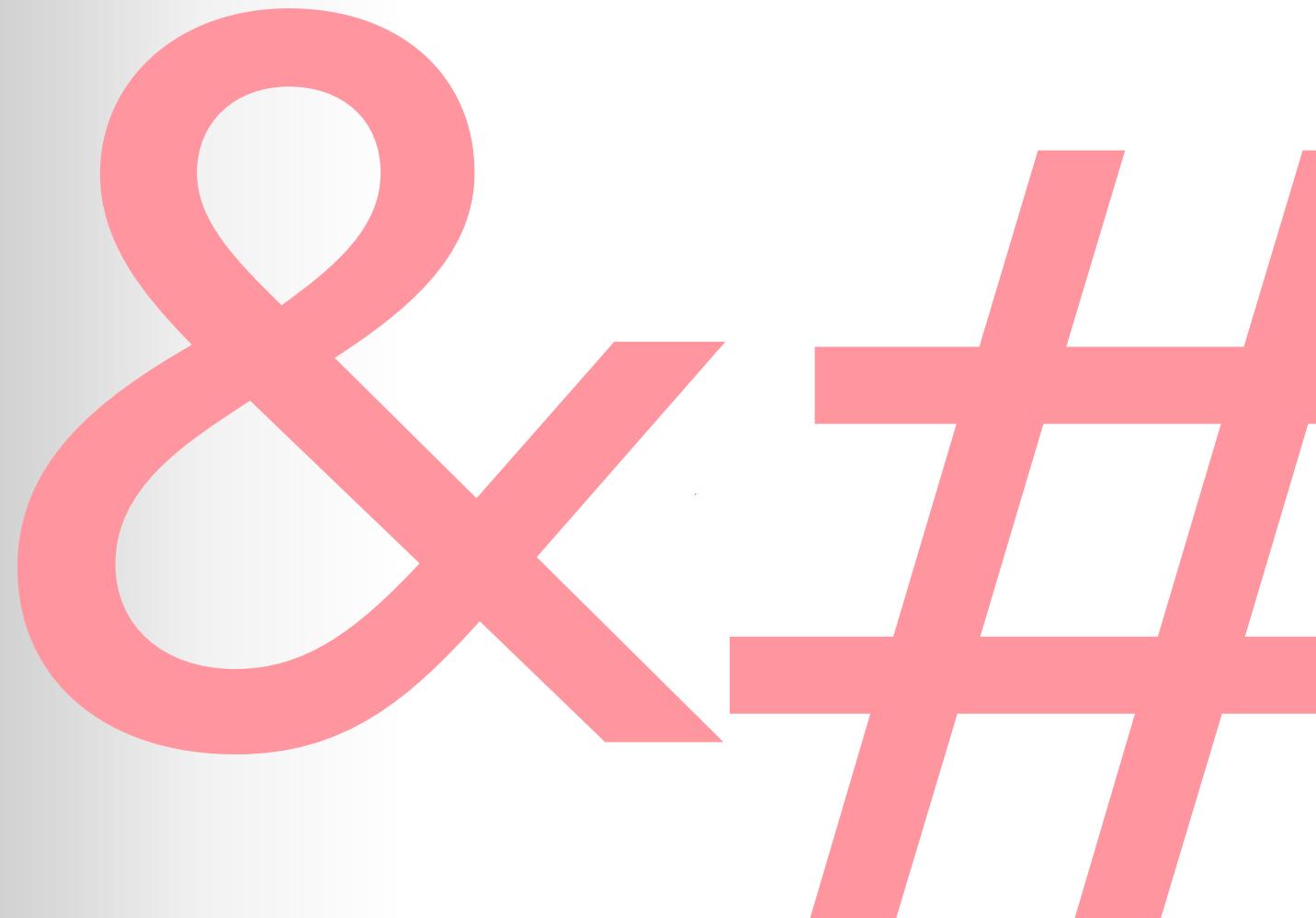
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Analyse & Tal is a cooperative analysis agency with offices in Copenhagen and Oslo. We tackle the difficult tasks and specialise in combining traditional methods with new digital solutions to provide better answers to difficult questions.

Analysis & Tal has been in operation since 2014 and currently has 25 employees. Our team consists of sociologists, statisticians, economists, programmers, communicators and designers who work across disciplines on our projects. These projects cover

disinformation, online hate, activism, business analyses and evaluations of everything from social initiatives to digital online solutions.

Analysis & Tal's dream is to create a more egalitarian and equal society. That is why we have chosen to organize ourselves as an employee-owned cooperative. We are proud to invest our profits into the development of new methods, projects and a more egalitarian society.



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