

TECH TALK



DANNY FORTSON IN SAN FRANCISCO

Can TikTok keep leading critics a merry dance?

The app, linked to child deaths, is finally coming under scrutiny

Every year, Harvard's student newspaper surveys incoming undergraduates. This year's was full of gems. The class of 2025, it found, was "largely affluent, white, straight and from the country's coastal regions". A stunning revelation? Perhaps not. But another was. Fewer students use Facebook in 2021 than they did back in 2004, when a teenage Mark Zuckerberg released thefacebook.com from his Harvard residence hall and it spread like wildfire across campus and then the world.

Harvard was ground zero for Zuck's revolution. But in social media, 17 years might as well have been a century ago. According to the Harvard Crimson survey, only 24 per cent of the university's incoming 17, 18 and 19-year-olds have a Facebook account. Where are they spending most of their time online? TikTok. More than 80 per cent of respondents used the popular lip-syncing app daily; 10 per cent were on it for more than two hours a day.

That is the type of saturation consumption upon which Zuckerberg built his empire. Yet for young people, Zuck's apps are old hat. TikTok, which is owned by Beijing internet giant ByteDance, announced in September that it had just passed one billion monthly users. It hit the milestone just five years after it launched, faster than any app in history. And kids have flocked to it.

Thirteen per cent of American parents of children aged 11 or under said that their kids were on TikTok – way above the 5 per cent who said they used Instagram and higher than the 10 per cent who used Snapchat, according to Pew Research. The app recently passed YouTube for average monthly watch time among Britons and Americans and is on track to have more Gen Z users (born between 1997 and 2012) by the year's end than Instagram. Meanwhile, the company is being sued in America and Britain for allegedly harvesting the data of child users. Children are, under US and British law, not allowed to open their own online accounts until the age of 13.

All of which raises the question: why are regulators and politicians so obsessed with Facebook and Instagram when TikTok last year leapfrogged them to become the world's most downloaded app? It is a hotbed of sexualised content, abuse and predation and, increasingly, is the source of dangerous viral "challenges" that have led to bullying and, in some cases, the deaths of children. Yet, while one TikTok UK communications executive was hauled before parliament's digital, culture, media and sport commit-

tee last year over online harms, none has been forced to testify before Congress. Its chief executive Shou Zi Chew, a Singapore native who read economics at University College London and was a former Facebook intern, is an anonymous figure. By contrast Zuckerberg, Twitter's Jack Dorsey and Google's Sundar Pichai are no strangers to public floggings.

TikTok's relatively easy ride could be about to change. The Senate subcommittee on consumer protection, which this month heard from Facebook whistleblower Frances Haugen, is understood to have demanded testimony from TikTok. The hearing, which is expected to focus on its approach to children and teenagers and may include executives from Snap and YouTube, could happen next week.

Josh Golin, executive director of children's rights group Fairplay, said: "Everybody is hyper-focused on Facebook right now because of the whistleblower, but it would be a grave mistake if people came away with the idea that these are only Facebook problems. We need to regulate social media when it comes to children." He added: "What makes TikTok among the most concerning sites is that they're really good at what they do."

TikTok is a different kind of social network. It is entirely video-based, allowing users to create clips from a few seconds long up to three minutes, set to music and embellished with an array of effects. As soon as you open the app, a video starts. It is an immediate and arresting sensory experience. Unlike Facebook, Instagram, Snapchat and Twitter, TikTok does not rely on your "social graph" – the friends you follow – to figure you out and populate your feed. Its core algorithm analyses every detail and action you take: how long you linger over a video, what's in the

video itself, or whether you swipe before it is done. Because the screen is filled by a single video at a time and virtually nothing else, TikTok's algorithm gleans pure signals about your interests, said Eugene Wei, a former Facebook and Hulu product executive. He added: "You don't have to follow people in order for them to start to figure out what interests you. That's really important, and one reason it has grown so fast." In short, TikTok is watching you in a way that rivals don't.

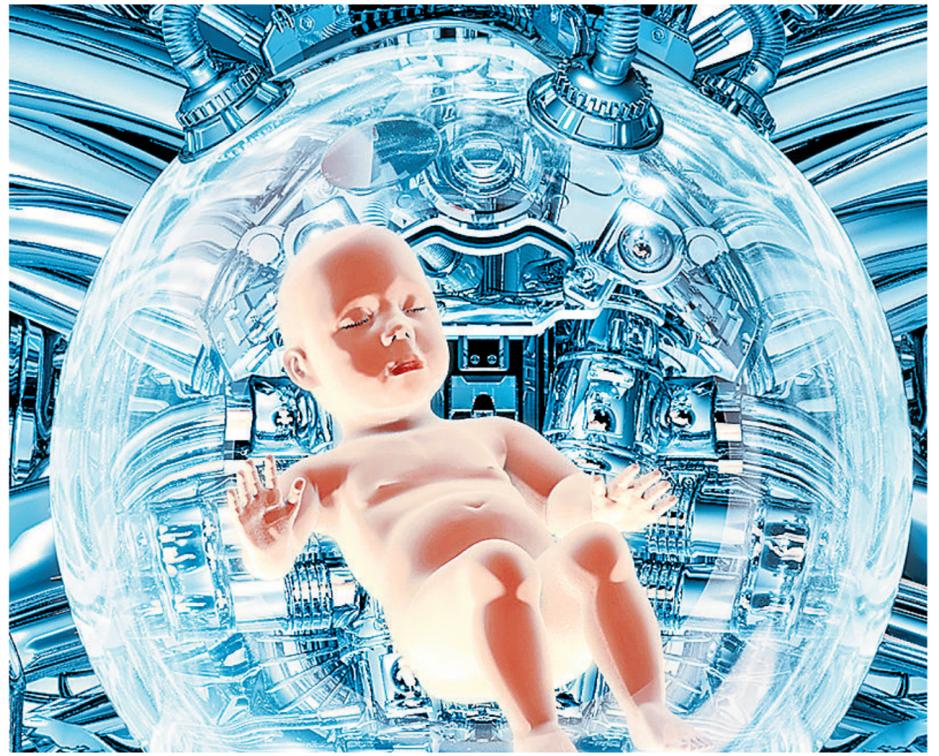
The algorithm also brutally deprioritises all but the most entertaining posts. "If a video is not engaging, the algorithm just will not show it to anybody," Wei said. "The flipside is that if something is good or engaging, they will supercharge the distribution to an extent that we haven't seen in other social media apps."

This is one reason viral sensations on TikTok are so powerful, helping stars emerge out of nowhere with astonishing speed. Lil Nas X parlayed his remixed *Old Town Road*, which went viral in 2019, into a multi-platinum music career.

It can also supercharge darker elements. In April, a boy aged 12 in Aurora, Colorado, died participating in a viral TikTok phenomenon, the "blackout challenge", which encouraged people to hold their breath until they passed out. Several children, including a ten-year-old girl in Italy, are thought to have died attempting the stunt. Last month France's education minister spoke out against a bullying campaign on the app. Under the hashtag Anti2010, it led to bullying of 11-year-olds as they returned to school after summer. Senator Richard Blumenthal, who leads the committee calling TikTok to testify, wrote to the company last month over another trend called "devious licks", in which children and teenagers posted videos of themselves stealing or defacing school property, clogging toilets and performing other "destructive acts".

In the three months to June, TikTok said that it had removed more than 81 million videos that violated its rules on bullying, suicide, hateful content and violent extremism. The violating posts represented less than 1 per cent of the total videos, and nine in ten were removed before getting a single view, it said. The company also banned "devious licks" and the "blackout challenge" within weeks.

But the company is encountering the problems of sheer size that have dogged Facebook for years. It may catch the vast majority of harmful content before anyone sees it, but even small percentages, in the context of billions of posts, can be deeply destructive. TikTok said: "We take privacy seriously and are committed to ensuring that TikTok remains a secure and entertaining network for our users."



The falling price of genome sequencing has led to a surge in companies using technology to cut the risk of chronic disease

The next baby boom: start-ups screen embryos to create 'designer children'

Delian Asparouhov, a 27-year-old tech entrepreneur and investor, wants to "beat China", which he reckons is the biggest single threat to western democracy.

The best way to do so? Make genetically superior Americans, of course. Asparouhov and his wife are doing their part. They have signed up to use a novel technology that tests in-vitro embryos for their proclivities to a range of genetic maladies. Each potential baby is assigned a score before implantation, based on how likely they are to develop schizophrenia, diabetes, cancer and other diseases. Asparouhov tweeted recently: "We are scoring embryos and selecting the best to turn into our kids."

Welcome to the brave new world that a crop of ambitious start-ups are seeking to usher in. Genomic Prediction, a New Jersey company that traces its research back to BGI Group, formerly known as Beijing Genomics Institute, is the most prominent – and the one being used by Asparouhov. Its promise: to offer parents "choice over chance".

The company claims to be working with more than 50 fertility clinics around the world, including Care Fertility in Nottinghamshire,

where for \$400 – and a \$1,000 induction fee – it screens an embryo conceived in vitro for an array of genetic signals that together yield probabilities for a number of the most common potential maladies. For Genomic Prediction, this assessment is expressed in a single score, which guides parents on which embryo to choose.

But that is only the beginning. Daniel Benjamin, a geneconomist at UCLA, said that the technology can already be used to select embryos for intellectual capability, skin tone and hair type. Companies have thus far shied away for fear of blowback, but for how long? Benjamin said: "Society is not ready for this."

In July a slate of 13 doctors and researchers, Benjamin among them, authored an article for the *New England Journal of Medicine* that called for an "urgent society-wide conversation" on the core technology, called PGT-P, or pre-implantation genetic testing for polygenic disorders. It has advanced dramatically in recent years, leading to a flurry of start-ups such as Orchid Health and Myome. The authors raised a number of concerns. The sheer cost could exacerbate societal divisions. Benjamin said: "It's not too crazy to imagine that parents of high

socioeconomic status might find embryo selection sufficiently attractive to choose IVF, as these predictors improve. We could be talking about pretty big differences in expected IQ and educational attainment."

Most genetic data that has been used to train the screening models is of people of European descent, which means that people of other races and backgrounds are likely to benefit less from the technology. And companies may over-promise what they can deliver.

The start-ups are all riding the same trend: the plunging price of genome sequencing.

“We are selecting the best to turn into our kids”

The first human genome to be sequenced took more than 13 years and cost \$2.7 billion. Today, it costs as little as \$600 and is forecast to hit \$100.

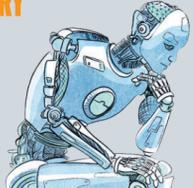
"Within the next few years everyone will have their whole genome on their iPhone," said Joshua Browder, British founder of the robot lawyer start-up DoNotPay, who has personally invested in two companies, including Orchid. "There's a lot of controversy around, like, 'Should you be doing this?'. I'm a big believer in using technology to make sure that there's no one born with a genetic illness that can really ruin someone's life and also ruin the family's life."

Orchid takes saliva samples from couples to sequence each of their genomes and then screens how likely their offspring are to develop common chronic diseases. If they are high risk, Orchid also offers embryo testing.

Browder recently funded another company, which has yet to be named. It plans to analyse DNA data already gathered from at-home tests, from operators such as 23andMe, to conduct a much more fulsome analysis of an individual's genetic makeup – theoretically allowing people to take measures, such as changing their diet, to avoid the diseases they are predisposed to suffer.

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