

Children with higher infant screen time showed an accelerated maturation of some brain networks, which, despite how it sounds, is not beneficial for the developing brain.
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Babies with too much screen time may become anxious teens: Singapore study

But all is not lost – parent-child activities like reading can counteract brain changes

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Using electronic devices to distract and calm noisy, restless babies used to be a great idea, or so parents thought.

Singapore scientists recently found that children exposed to high levels of screen time before the age of two showed changes in brain development linked to slower decision-making and increased anxiety by the time they become teenagers.

However, all is not lost – for children whose parents read to them frequently from age three, the link between infant screen time and altered brain development was significantly weakened.

The new research is led by Assistant Professor Tan Ai Peng, a principal scientist at A*STAR's Institute for Human Development and Potential (IHDP) (Translational Neurosciences). It is Singapore's largest birth cohort study that links infant screen exposure to long-term changes in the brain and adolescent mental health.

"This research gives us a biological explanation for why limiting screen time in the first two years is crucial. It also highlights the importance of parental engagement, showing that parent-child activities, like reading together, can make a real difference," said Dr Tan, who is also a clinician-scientist at the National University of Singapore (NUS).

The study tracked 168 children from the Growing Up in Singapore Towards healthy Outcomes (GUSTO) cohort for more than 10 years and conducted brain scans at several points to map a possible sequence of reaction from infant

screen exposure to teen mental health.

It focused on infancy, a period when brain development is most rapid and especially sensitive to environmental influences; and the amount and type of screen exposure during this period, which are largely determined by parental and caregiver awareness, and parenting practices.

GUSTO, a nationwide birth cohort study of Singaporean mothers and their babies, was set up in 2009 to understand how conditions during pregnancy and early childhood affect both the mother's and child's health, growth and development.

They include metabolic, neurodevelopmental and other conditions, all of which are of major public health and economic importance in Asia and worldwide.

This recent paper, published in *eBioMedicine*, a peer-reviewed open-access medical journal, is the first on screen time to incorporate measures spanning over 10 years, highlighting long-lasting consequences of screen time in infancy.

"When we started this study, we thought that it would be really interesting to see how the altered development in this grey matter would actually result in the long-term anxiety symptoms when these children go into the adolescent years, when they make new friends, when they are exposed to different social environments. There is a high possibility that they may not be able to cope well," Dr Tan said.

The researchers conducted brain scans for the 168 children at the ages of 4½, six and 7½ years, allowing them to track how brain networks develop over time rather than relying on a single snapshot.

They found that children with

higher infant screen time showed an accelerated maturation of brain networks responsible for visual processing and cognitive control.

Dr Tan told *The Straits Times* that while many people might think early maturation or accelerated growth is often linked to something that is beneficial to the developing brain, "it is really not the case".

"The first few years of life are when the brain is starting to learn real-world experiences. It is important that they get exposed to different types of environmental stimuli, and not just very excessive visual stimulation like what they get on screen," she said.

Dr Tan said that while the videos on screens are attention-grabbing and visually appealing, they do not really provide a good mix of touch, facial expressions, or back-and-forth communication.

"When that occurs during this sensitive period of development, the brain would develop (much faster) in the area where there is much visual stimulation. Everything is being channelled to the part of the brain that is involved in visual processing, which then results in some altered development in other critical parts of the brain."

Dr Huang Pei, a senior scientist with A*STAR's IHDP and first author of the study, said screen time at an early age "limits flexibility and resilience, leaving the children less able to adapt later in life".

He told ST the "premature specialisation" came at a cost – children with altered brain networks took longer to make decisions during a cognitive task at 8½ years old, and those who were slower in decision-making reported higher symptoms of anxiety at age 13.

However, an earlier study, published in *Psychological Medicine*, a leading international journal in the fields of psychiatry, clinical psychology and the related basic sciences, in 2024 by the same team, found that parent-child reading

could counteract some of the brain changes.

Dr Tan said: "It is not about this specific activity. Rather, it is about doing something together that engages the child. If you like building LEGO sets, you can build them with the child. If you prefer running outdoors, take your child with you. If you like swimming, swim with your child. Do something that the family enjoys. It will counteract the effects of screen time."

An inaugural Ministry of Digital Development and Information survey, released on Sept 12, found that more than half of children aged between two and six in Singapore spend more than an hour daily on digital devices, and the figure balloons to 81 per cent on weekends.

This exceeds the recommended one-hour limit of screen time set by the Ministry of Health (MOH).

So, as part of a new national health strategy to encourage children to adopt a healthier lifestyle, MOH came up with stricter and clearer guidelines on screen use, such as that children younger than 18 months old should not be allowed screen time.

Sharing practical tips to help parents manage screen use in real life, Dr Huang said: "The message we want to bring forth is about using screen time responsibly, about getting a child to be engaged and not just passively viewing the video and just being bombarded by the visual stimulation. We would want the child to process the information (together with his parent). We should not be thinking of screen time as the enemy."

He added: "Some baby steps that parents can take is regulating the content by choosing less visually stimulating shows... or actively participating in the screen time with the children so they are not just passively watching and processing the information of the show."

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