Evidence Briefing:
How Can We Promote Child Language and Literacy Development in an Increasingly Digital World?

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Introduction

Children are part of a natural experiment, surrounded by portable digital tools that afford novel and quite intuitive interactions. However, the evidence on how digital media influence child language and literacy development is sparse and inconsistent, and clear guidelines for educators and policymakers are lacking. Therefore, to maximise learning opportunities for every child in today's digital world, it is crucial to critically review the latest scientific evidence and translate it into recommendations that are accessible to stakeholders.

Taking a holistic perspective on child development, we integrated the World Health Organisation guidelines (World Health Organization, 2019) with insights from the latest experimental and longitudinal research on children's learning from digital media. Much prior work has shown that not all screen time is created equal: While it is essential to manage screen time, the content and context of digital media use are also critical factors to consider (Madigan et al., 2020). This evidence briefing summarises current guidelines on how to manage screen time and discusses the content and context of digital media use associated with benefits for language and literacy development. In doing so, we paid particular attention to the role of child characteristics.

These evidence-based recommendations are summarised in an accessible video format available in English, German, and Italian, with subtitles in multiple languages.

To watch the video, please scan the QR Code.

Screen time

The World Health Organisation recommends that children between two and four years of age should have less than one hour of screen time per day (World Health Organization, 2019). Importantly, everyday activities, including peer play, should not be displaced (Putnick et al., 2023). Screen time at bedtime should be avoided, as it negatively affects children's sleep, which helps consolidate learning (Lan et al., 2020). Different tools are available to help caregivers manage screen time, such as the family media plan, currently available in English and Spanish (American Academy of Pediatrics, 2022).

Digital content

The Canadian Paediatric Society recommends the use of apps that foster learning, creativity, and interaction (Canadian Paediatric Society, 2017). For example, the digital content should be age-appropriate and consider what children already know and what they can learn (Canadian Paediatric Society, 2017; Hassinger-Das et al., 2020).

Furthermore, digital features that provide auditory and visual support for the pronunciation and meaning of words can

help 5- to 8-year-old children understand what they read on screen (Diprossimo et al., 2023). These multimodal supports are particularly helpful for children who struggle with reading and comprehending texts (Diprossimo et al., 2023). For deaf/hard-of-hearing children, multimodal and multisensory features (images, videos, oral and sign language) are effective in improving receptive and expressive oral vocabulary as well as signed vocabulary (Aldemir et al., 2023).

Social interaction

Social interaction between caregiver and child is important for learning. It has been shown to have a positive effect on engagement and learning from digital media (Hassinger et al., 2020).

For example, the amount of time spent sharing technology with a social partner has a positive impact on language development, compared with the amount of time spent alone by the child with screens (Madigan et al., 2020). Several strategies can help children better understand what they see on screen during joint digital media use: Asking questions, highlighting important points, and connecting the digital content to the child's own experiences are powerful strategies to support understanding and word learning (e.g., Dore et al., 2018; Strouse et al., 2018).

Advances in social robotics, incorporating social cues such as gaze, are effective in supporting children's vocabulary acquisition within real-world settings (Sivridag & Mani, 2024). These findings underscore the importance of leveraging social interactions in digital environments to support language development.

Future directions

In moving forward, multidisciplinary collaborations are key. Thus, knowledge-sharing and sustained partnerships between computer scientists, psychologists, educators, and speech and language therapists hold the promise to exploit the full potential of digital tools.

For instance, augmented reality may be explored further as a support for language learning in children with autism spectrum disorder (El Shemy et al., 2024).

Additionally, to fulfil the potential of digital media as a support for language and literacy development, significant technical advancements are still needed. For example, the automatic recognition of children's speech remains a challenge. As a result, digital media are limited in the extent to which responses are tailored to a child interlocutor. In this context, new techniques, such as data augmentation for child speech recognition, emerge as a promising technique to achieve adequate child speech recognition (Fan et al., 2023), paving the way for significant educational and clinical applications.

Finally, careful consideration of age-appropriate interactive features and cognitive processing differences in the child population is essential to inform the design of digital tools (Abreu et al., 2023; Aldemir et al., 2023; Diprossimo et al., 2023).

Conclusive remarks

By presenting these recommendations, and examples from supporting research, we seek to demonstrate how best to translate complex research into actionable guidance for parents, educators, and policymakers. In this way, we aim to promote evidence-based decision-making and encourage a balanced use of digital media for children's language growth.

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