

Deleterious Associations with Baby, Toddler, and Caregiver Digital Device Use

Global Research Highlights and Additional Documents Referenced in GAINING Alerts (2019-2026)

Associations with Atypical Brain Development

[Associations between digital media use and brain surface structural measures in preschool-aged children](#)

Hutton, J. S., Dudley, J., DeWitt, T., & Horowitz-Kraus, T. (2022). Associations between digital media use and brain surface structural measures in preschool-aged children. *Scientific reports*, 12(1), 19095. <https://doi.org/10.1038/s41598-022-20922-0>
(USA)

Study found associations between “higher digital media use and lower cortical thickness and sulcal depth among 3- to 5-year-olds in brain areas supporting primary visual processing and higher-order functions such as top-down attention, complex memory encoding, letter recognition and social cognition.”

Associations with Atypical Neural Activity

[Associations Between Infant Screen Use, Electroencephalography Markers, and Cognitive Outcomes](#)

Law, E. C., Han, M. X., Lai, Z., Lim, S., Ong, Z. Y., Ng, V., Gabard-Durnam, L. J., Wilkinson, C. L., Levin, A. R., Rifkin-Graboi, A., Daniel, L. M., Gluckman, P. D., Chong, Y. S., Meaney, M. J., & Nelson, C. A. (2023). Associations Between Infant Screen Use, Electroencephalography Markers, and Cognitive Outcomes. *JAMA pediatrics*, 177(3), 311–318. <https://doi.org/10.1001/jamapediatrics.2022.5674>
(SINGAPORE, USA, NEW ZEALAND, CANADA)

“Infant screen use was associated with altered cortical EEG activity before age 2 years; the identified EEG markers mediated the association between infant screen time and executive functions.”

Associations with Executive Functioning and Emotional Reactivity

[Early-Childhood Tablet Use and Outbursts of Anger](#)

Fitzpatrick, C., Pan, P. M., Lemieux, A., Harvey, E., Rocha, F. A., & Garon-Carrier, G. (2024). Early-Childhood Tablet Use and Outbursts of Anger. *JAMA pediatrics*, 178(10), 1035–1040. <https://doi.org/10.1001/jamapediatrics.2024.2511>
(CANADA)

“Child tablet use at age 3.5 years was associated with more expressions of anger and frustration by the age of 4.5 years. Child proneness to anger/frustration at age 4.5 years was then associated with more use of tablets by age 5.5 years.”

[Longitudinal Associations Between Use of Mobile Devices for Calming and Emotional Reactivity and Executive Functioning in Children Aged 3 -5](#)

Radesky, J. S., Kaciroti, N., Weeks, H. M., Schaller, A., & Miller, A. L. (2023). Longitudinal Associations Between Use of Mobile Devices for Calming and Emotional Reactivity and Executive Functioning in Children Aged 3 to 5 Years. *JAMA pediatrics*, 177(1), 62–70. <https://doi.org/10.1001/jamapediatrics.2022.4793>
(USA)

Study suggests that “frequent use of mobile devices for calming young children may displace their opportunities for learning emotion-regulation strategies over time; therefore, pediatric health care professionals may wish to encourage alternate calming approaches.”

[Screen Time and Executive Functioning in Toddlerhood: A Longitudinal Study](#)

McHarg, G., Ribner, A. D., Devine, R. T., & Hughes, C. (2020). Screen Time and Executive Function in Toddlerhood: A Longitudinal Study. *Frontiers in psychology*, 11, 570392. <https://doi.org/10.3389/fpsyg.2020.570392>
(UK, USA)

“Screen time at age 2 is negatively associated with the development of executive functions in toddlerhood from age 2 to 3, controlling for a range of covariates including verbal ability.”

Associations with Atypical Sensory Processing

[Early-life Digital Media Experiences and Development of Atypical Sensory Processing](#)

Heffler, K. F., Acharya, B., Subedi, K., & Bennett, D. S. (2024). Early-Life Digital Media Experiences and Development of Atypical Sensory Processing. *JAMA pediatrics*, 178(3), 266–273. <https://doi.org/10.1001/jamapediatrics.2023.5923>
(USA)

“Early-life TV or video exposure was associated with atypical sensory processing in low registration, sensation seeking, sensory sensitivity, and sensation avoiding domains of the Infant-Toddler Sensory Profile, after controlling for perinatal and demographic variables.”

Associations with Language Delay

[The Relationship between Language and Technology: How Screen Time Affects Language Development in Early Life—A Systematic Review](#)

Massaroni, V., Delle Donne, V., Marra, C., Arcangeli, V., & Chieffo, D. P. R. (2023). The Relationship between Language and Technology: How Screen Time Affects Language Development in Early Life-A Systematic Review. *Brain sciences*, 14(1), 27. <https://doi.org/10.3390/brainsci14010027>
(ITALY)

Systematic review of 18 articles shows “prolonged screen time and exposure to screens in the first 2 years of life can negatively affect language development and communication skills, in terms of comprehension and vocabulary range. In addition, overexposure to screens in the early years can affect overall cognitive development, especially attention to environmental stimuli, social experiences, problem solving, and communication with others, e.g., the alternance of rhythms and roles in a conversation.”

[Mobile Device Use is Associated with Expressive Language Delay in 18-Month-Old Children](#)

Van den Heuvel, M., Ma, J., Borkhoff, C. M., Koroshegyi, C., Dai, D. W. H., Parkin, P. C., Maguire, J. L., Birken, C. S., & TARGet Kids! Collaboration (2019). Mobile Media Device Use is Associated with Expressive Language Delay in 18-Month-Old Children. *Journal of developmental and behavioral pediatrics : JDBP*, 40(2), 99–104. <https://doi.org/10.1097/DBP.0000000000000630>
(CANADA)

Study demonstrated a “significant association between mobile media device use and parent-reported expressive speech delay in 18-month-old children.”

[Screen Time and Parent-Child Talk When Children Are Aged 12 to 36 Months](#)

Brushe, M. E., Haag, D. G., Melhuish, E. C., Reilly, S., & Gregory, T. (2024). Screen Time and Parent-Child Talk When Children Are Aged 12 to 36 Months. *JAMA pediatrics*, 178(4), 369–375. <https://doi.org/10.1001/jamapediatrics.2023.6790>
(AUSTRALIA)

This cohort study found a negative association between screen time and measures of parent-child talk across those early years. For every additional minute of screen time, children heard fewer adult words, spoke fewer vocalizations, and engaged in fewer back- and-forth interactions.

Associations with Problem-solving Developmental Delay

[Screen Time at Age 1 Year and Communication and Problem-Solving Developmental Delay at 2 and 4 Years](#)

Takahashi, I., Obara, T., Ishikuro, M., Murakami, K., Ueno, F., Noda, A., Onuma, T., Shinoda, G., Nishimura, T., Tsuchiya, K. J., & Kuriyama, S. (2023). Screen Time at Age 1 Year and Communication and Problem-Solving Developmental Delay at 2 and 4 Years. *JAMA Pediatrics*, 177(10), 1039–1046. <https://doi.org/10.1001/jamapediatrics.2023.3057>
(JAPAN)

Study shows “association between screen time among young children and subsequent developmental outcomes.” Results suggest “a dose-response association between longer screen time at age 1 year and developmental delays in communication and problem- solving at ages 2 and 4 years.”

Associations with Peer Social Functioning Problems

[Longitudinal Associations Between Screen Time and Children's Language, Early Educational Skills, and Peer Social Functioning](#)

Gath, M., Horwood, L. J., Gillon, G., McNeill, B., Woodward, L.J. (2026) *Developmental Psychology*, 62(3), 638–652. <https://doi.org/10.1037/dev0001907>
(NEW ZEALAND)

“Results indicate that more than 1.5 hour of daily direct screen time at age 2 was associated with below average language and educational ability and above average levels of peer relationship problems at age 4.5.”

Associations with Caregiver Device Use in Child's Presence (Technoference)

[Parental Technology Use in a Child's Presence and Health and Development in the Early Years: A Systematic Review and Meta- Analysis](#)

Toleda-Vargas, M., Chong, K.H., Maddren, C.I., Howard, J.H., Wakefield, B., Okely, A.D. *JAMA Pediatrics*, May 5;179(7):730-737. <https://doi.org/10.1001/jamapediatrics.2025.0682>
(AUSTRALIA)

Twenty-one studies from 10 countries were included in the meta-analysis. Significant associations were found between parental technology use in the child's presence and cognition, internalizing behavior and emotions, externalizing behavior, prosocial behavior, attachment, and screen time.

[Associations between audible technoference, quality of parent-infant interactions, and infants' vocabulary development](#)

Corkin, M, Henderson, A., Peterson, E., Kennedy-Costantini, S., Sharplin, H. Morrison, S. *Infant Behavior and Development* Volume 64, August 2021, 101611. <https://doi.org/10.1016/j.infbeh.2021.101611>
(NEW ZEALAND)

Higher frequency of parent mobile phones audible notifications was associated with lower infant vocabulary scores and led parents to become generally more directive towards their infants, with less responsiveness and scaffolding; Higher levels of infant exposure to background TV were also associated with decreased parental scaffolding. Infant vocabularies were larger when parents turned off or put away mobile devices when with their infants.

Associations with Infant Psychophysiological Stress

[“Hot stuff”: Behavioural and affective thermal responses to digital and non-digital disruptions during early mother-infant interaction](#)

Nazzari, S., Morgese Zangrandi, M., Bottini, G., Salvato, G., Provenzi, L. *Biological Psychology* Volume 196, March 2025, 109027. <https://doi.org/10.1016/j.biopsycho.2025.109027>
(ITALY)

Findings show that both digital and non-digital distractions disrupt parent-infant interactions, leading to physiological and behavioural responses in mother-infant dyads. Parental unresponsiveness due to digital and non-digital distractions leads to infant behavioural distress, with digital disruptions also triggering a distinct thermal affective response.

Associations with Lower Mother-to-Infant Attachment Quality

[Associations between maternal technology use, perceptions of infant temperament, and indicators of mother-to-infant attachment quality](#)

Alvarez Gutierrez, S., & Ventura, A. K. (2021). Associations between maternal technology use, perceptions of infant temperament, and indicators of mother-to-infant attachment quality. *Early human development*, 154, 105305. <https://doi.org/10.1016/j.earlhumdev.2021.105305>
(USA)

“Greater technology use during mother-infant interactions was significantly associated with greater infant negative affectivity. Greater technology use was also significantly associated with lower mother-to-infant attachment quality and greater hostility toward motherhood.”

Associations with Decreased Sleep Quantity and Quality

[Relationships between screen viewing and sleep quality for infants and toddlers in China: A cross-sectional study](#)

Lin, Y., Zhang, X., Huang, Y., Jia, Z., Chen, J., Hou, W., Zhao, L., Wang, G., & Zhu, J. (2022). Relationships between screen viewing and sleep quality for infants and toddlers in China: A cross-sectional study. *Frontiers in pediatrics*, 10, 987523. <https://doi.org/10.3389/fped.2022.987523> (CHINA)

“Screen time negatively related to total sleep time and nighttime sleep among infants and toddlers. Authors consider small portable screens used ver long periods of time “real neurodevelopmental disruptors.”

Associations with Diminished Motor Skills / Asociaciones con habilidades motoras disminuidas

[Screen Time and Developmental Performance Among Children at 1-3 Years of Age in the Japan Environment and Children's Study](#)

Yamamoto, M., Mezawa, H., Sakurai, K., Mori, C., & Japan Environment and Children's Study Group (2023). Screen Time and Developmental Performance Among Children at 1-3 Years of Age in the Japan Environment and Children's Study. *JAMA pediatrics*, 177(11), 1168–1175. <https://doi.org/10.1001/jamapediatrics.2023.3643> (JAPAN)

“We found a bidirectional association between TV/DVD screen time and developmental scores in the communication domain from age 1 to 2 years. Additionally, we observed negative associations between TV/DVD screen time at age 2 years and the developmental scores in gross motor, fine motor, and personal-social domains at age 3 years.”

Associations with Development of Autistic-like Symptoms and Autism

[Toddler Screen Time: Longitudinal Associations with Autism and ADHD Symptoms and Developmental Outcomes](#)

Hill, M. M., Gangi, D. N., & Miller, M. (2024). Toddler Screen Time: Longitudinal Associations with Autism and ADHD Symptoms and Developmental Outcomes. *Child psychiatry and human development*, 10.1007/s10578-024-01785-0. Advance online publication. <https://doi.org/10.1007/s10578-024-01785-0> (USA)

Greater screen time is associated with increased symptoms of autism spectrum disorder (autism), attention-deficit/hyperactivity disorder (ADHD), and lower scores on measures of development in preschool-aged community samples.

[Association Between Screen Time Exposure in Children at 1 Year of Age and Autism Spectrum Disorder at 3 Years of Age](#)

Kushima, M., Kojima, R., Shinohara, R., Horiuchi, S., Otawa, S., Ooka, T., Akiyama, Y., Miyake, K., Yokomichi, H., Yamagata, Z., & Japan Environment and Children's Study Group (2022). Association Between Screen Time Exposure in Children at 1 Year of Age and Autism Spectrum Disorder at 3 Years of Age: The Japan Environment and Children's Study. *JAMA pediatrics*, 176(4), 384–391. <https://doi.org/10.1001/jamapediatrics.2021.5778> (JAPAN)

“Among boys, longer screen time at 1 year of age was significantly associated with autism spectrum disorder at 3 years of age. With the rapid increase in device usage, it is necessary to review the health effects of screen time on infants and to control excessive screen time.”

[Association of Early-Life Social and Digital Media Experiences With Development of Autism Spectrum Disorder-Like Symptoms](#)

Heffler, K. F., Sienko, D. M., Subedi, K., McCann, K. A., & Bennett, D. S. (2020). Association of Early-Life Social and Digital Media Experiences With Development of Autism Spectrum Disorder-Like Symptoms. *JAMA pediatrics*, 174(7), 690–696. <https://doi.org/10.1001/jamapediatrics.2020.0230> (USA)

“This cohort study found greater screen exposure and less caregiver-child play early in life to be associated with later ASD-like symptoms. Further research is needed to evaluate experiential factors for potential risk or protective effects in ASD.”

Screen time reduction and focus on social engagement in autism spectrum disorder: A pilot study

Heffler, K. F., Frome, L. R., Garvin, B., Bungert, L. M., & Bennett, D. S. (2022). Screen time reduction and focus on social engagement in autism spectrum disorder: A pilot study. *Pediatrics International: official journal of the Japan Pediatric Society*, 64(1), e15343. <https://doi.org/10.1111/ped.15343>
(USA)

“In young children (18 to 40 months) with ASD and high screen time, this intervention study, though small, was associated with 1) a significant reduction in the children’s screen time, 2) a significant reduction in the children’s autism symptoms and 3) a significant reduction in parent stress.”

Associations with Greater Risk of Accidental Injury

Hold the Phone! Cell Phone-Related Injuries in Children, Teens, and Young Adults Are On the Rise

Guyon, P., Corroon, J., Ferran, K., Hollenbach, K., Nguyen, M. (2020) *Sage Open Pediatrics (GPH)* <https://doi.org/10.1177/2333794X209684>
(USA)

Age-adjusted incidence rates demonstrate increases in cell phone-related injuries across all age groups on average from 2002 to 2015, with children 2 years of age and under experiencing the single highest incidence (159 injuries per 100 000) in 2014.

Associations with Exposure to Artificial Intelligence Products.

The Role of Affectionate Caregiver Touch in Early Neurodevelopment and Parent-Infant Interactional Synchrony /

Corozza, S., Leong, V. (2021) *Frontiers in Neuroscience*, Jan 5;14:613378. <https://doi.org/10.3389/fnins.2020.613378>
(UK, SINGAPORE, GERMANY, SWEDEN)

The authors propose a unique role for affectionate human touch as an essential pathway to establishing and maintaining parent-infant interactional synchrony at behavioral and neural levels.

Additional Documents Cited in GAINING Alerts

[Changes in Brain Weight During the Span of Human life: Relation of Brain Weights to Body Heights and Body Weights](#)

[Digital Ecosystems, Children, and Adolescents: Policy Statement | Pediatrics | American Academy of Pediatrics](#)

[Charter for Care of Young Children](#)

[German National Screen Time Guidelines](#)

[Screen use by children aged under 5 - GOV.UK](#)

[Technoference: Parent Distraction With Technology and Associations With Child Behavior Problems | Child Development | Oxford Academic](#)

[AI in the Early Years: Examining the implications of GenAI toys for young children](#)

[AI Toys Advisory - Fairplay](#)

[Generation AI starts early: A guide to technologies already shaping young children's lives | Brookings](#)

[Prevalence and Characteristics of Manipulative Design in Mobile Applications Used by Children](#)

[Early and Excessive Exposure to Screens \(EEES\): A New Syndrome](#)

[Special Education Is Getting More Expensive, Forcing Schools to Make Cuts Elsewhere](#)

[Poll Shows Increases in Hearing, Speech, and Language Referrals, More Communication Challenges in Young Children](#)

[The lifetime social cost of autism: 1990–2029 - ScienceDirect](#)

[Infants' physiological and behavioral reactivity to maternal mobile phone use – An experimental study - ScienceDirect](#)

[The effects of background television on the toy play behavior of very young children - PubMed](#)

[U.S. Surgeon General's Advisory: Surgeon General's Warning on the Harms of Screen Use](#)

[Association between Screen Use and Child Language Skills](#)

[Elevated background TV exposure over time increases behavioural scores of 18-month-old toddlers - Chonchaiya - 2015 - Acta Paediatrica - Wiley Online Library](#)

[The impact of background television on parent-child interaction - PubMed](#)

[Infants' background television exposure during play: Negative relations to the quantity and quality of mothers' speech and infants' vocabulary acquisition - Elise Frank Masur, Valerie Flynn, Janet Olson, 2016](#)

[Learning From Video: A Meta-Analysis of the Video Deficit in Children Ages 0 to 6 Years - Strouse - 2021 - Child Development - Wiley Online Library](#)

[Media and Young Minds | Pediatrics | American Academy of Pediatrics](#)

[Global Prevalence of Meeting Screen Time Guidelines Among Children 5 Years and Younger: A Systematic Review and Meta-analysis | Media and Youth | JAMA Pediatrics | JAMA Network](#)

[Explaining Adherence to American Academy of Pediatrics Screen Time Recommendations With Caregiver Awareness and Parental Motivation Factors: Mixed Methods Study - PubMed](#)

[Young Children and Screens: Guidelines for Intervention during the Perinatal Period from the French National College of Midwives - Bernard - 2022 - Journal of Midwifery & Women's Health - Wiley Online Library](#)

[Skype me! Socially Contingent Interactions Help Toddlers Learn Language](#)

[Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age](#)

[Screen time of toddlers in Paris suburbs: Quantitative and qualitative analysis](#)

[Managing Postpartum Depression](#)