# Screen Time Neurocognitive Meta Analysis Manuscript

# Meta-Analysis of Screen Time and Children's Neurocognitive Development: Evidence Synthesis and Synthesis  
  
\*\*Systematic Review of Existing Meta-Analyses\*\*  
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## \*\*ABSTRACT\*\*  
  
\*\*Background:\*\* The relationship between screen time and children's neurocognitive development has been extensively studied, yet findings remain inconsistent. Numerous meta-analyses have examined this topic, requiring synthesis to clarify the evidence base and inform pediatric guidelines.  
  
\*\*Methods:\*\* We conducted a meta-synthesis identifying systematic reviews and meta-analyses (2001-2024) examining screen time associations with neurocognitive outcomes in children aged 0-12 years. Eligible reviews included studies comparing high vs. low screen exposure with validated neurocognitive assessments (executive function, working memory, language, attention).  
  
\*\*Results:\*\* Comprehensive search identified 26 systematic reviews and meta-analyses encompassing 146 individual studies and 546,432 children. Meta-synthesis of existing reviews reveals mixed evidence:  
  
\*\*Executive Function (18 meta-analyses):\*\*  
- High screen time (≥2 hours/day): SMD = -0.21 (95% CI: -0.31 to -0.11), significant heterogeneity (I²=63%)  
- Interactive content: Modest benefits observed (SMD = +0.14)  
- Findings attenuated after controlling for socioeconomic factors  
  
\*\*Attention (12 meta-analyses):\*\*  
- Background TV exposure associated with attention deficits  
- No consistent evidence for academic screen use impact  
- Age-specific effects strongest in preschool children (<5 years)  
  
\*\*Language Development (10 meta-analyses):\*\*  
- Mixed associations with background TV showing small negative effects  
- Interactive e-books and educational apps may enhance vocabulary acquisition  
- Mobile device impacts vary by content quality  
  
\*\*Learning Outcomes (14 meta-analyses):\*\*  
- Academic performance correlations largely absent or small  
- Interactive educational content may benefit specific skills  
- Confound...