



The Impact of Early-Life Mobile Screen Exposure on Social Communication and Language Development in Children with Autism Spectrum Disorder

Rashna Rehman¹, Sana Shafique², Sidra Saeed³, Aqsa Noor⁴

¹ Shifa Tameer-e-Millat University, Islamabad, Pakistan

Email: Rashnamoneeb32@gmail.com

² Mphil in Psychology from Fatima Jinnah Women University, Rawalpindi

Email: sanashafique424@gmail.com

³ Currently Visiting faculty at Sound foundation, Quetta

Email: Sidra.saeed52@yahoo.com

⁴ Riphah international university Lahore campus

Email: aqsarana591@gmail.com

ARTICLE INFO

Submission:

June 18, 2026

Revised:

July 02, 2026

Accepted:

July 16, 2026

Available Online:

August 01, 2026

Keywords:

Autism Spectrum Disorder, mobile screen time, language development, social communication, parental co-viewing, Pakistan, displacement hypothesis

Corresponding author:

Sidra Saeed

Email:

Sidra.saeed52@yahoo.com

ABSTRACT

The proliferation of mobile devices has fundamentally altered early childhood environments, raising significant concerns for neurodivergent populations. Children with Autism Spectrum Disorder (ASD) are particularly vulnerable to the displacement of critical, face-to-face social interactions by screens. This study investigated the impact of early-life mobile screen exposure on social communication and language development in children with ASD within the socio-cultural context of Pakistan. A quantitative, cross-sectional design was utilized, sampling 190 children (aged 3–6 years) diagnosed with ASD from specialized developmental centers in Lahore and Karachi. Primary caregivers completed a culturally adapted Demographic and Screen Time Questionnaire, the Vineland Adaptive Behavior Scales, Third Edition (VABS-3) Communication Domain, and the Social Communication Questionnaire (SCQ). Results indicated a high average daily mobile screen time of 3.45 hours. Multiple linear regression analysis revealed that daily screen time was a significant negative predictor of adaptive communication skills ($\beta = -.48, p < .001$). Conversely, parental co-viewing frequency emerged as a significant positive predictor ($\beta = .26, p < .001$), with the overall model explaining 36% of the variance in communication scores (Adjusted $R^2 = .36, F(5, 184) = 22.45, p < .001$). The findings support the displacement hypothesis, suggesting that unmediated screen exposure exacerbates language and social communication deficits in children with ASD. However, active parental mediation significantly mitigates these adverse effects. Culturally tailored psychoeducation, particularly targeting joint family systems prevalent in Pakistan, and the strategic integration of co-viewing practices are strongly recommended to optimize developmental outcomes.

Introduction

The proliferation of mobile digital devices, particularly smartphones and tablets, has fundamentally altered the early childhood environment. Over the past decade, screen exposure has shifted from stationary television viewing to highly portable, interactive mobile media. According to recent data from the American Academy of Pediatrics (AAP, 2023), nearly all children under the age of five have access to a mobile device in the home, and daily screen time for this demographic has increased significantly. While mobile devices offer interactive educational applications and digital coping mechanisms, their ubiquitous presence has sparked considerable debate regarding their impact on early neurodevelopment.

For typically developing children, early childhood is a critical period for the acquisition of foundational social communication and language skills, which are primarily developed through reciprocal, face-to-face human interactions. However, for children with Autism Spectrum Disorder (ASD), these developmental domains are inherently vulnerable. ASD is characterized by persistent deficits in social communication and social interaction, alongside restricted, repetitive patterns of behavior (American Psychiatric Association, 2022). Children with ASD often exhibit atypical sensory processing and a preference for predictable, systemizing environments, which may make the highly structured, visually stimulating, and socially undemanding nature of mobile screens particularly appealing (So et al., 2021).

Historically, research on screen time and ASD has largely focused on early media exposure as a potential environmental risk factor for the onset of autistic traits. However, a more pressing and nuanced clinical question concerns the impact of early-life mobile screen exposure on the developmental trajectories of children already diagnosed with ASD. Because mobile devices are frequently used as solitary activities, there is a growing concern that excessive mobile screen time may exacerbate core ASD deficits by displacing crucial opportunities for joint attention, conversational turns, and social scaffolding (Madigan et al., 2024). Conversely, some researchers argue that mobile screens, when utilized appropriately, can serve as valuable therapeutic tools to enhance communication and emotional recognition (Hirsh-Pasek et al., 2023).

Therefore, understanding the multifaceted relationship between early-life mobile screen exposure and developmental outcomes in children with ASD is critical for clinicians, educators, and parents. The purpose of this paper is to review the current literature regarding the impact of early-life mobile screen exposure on social communication and language development in children with ASD. Specifically, this review will examine the bidirectional relationship between ASD and screen use, evaluate the displacement of social interaction, and analyze how the content and context of mobile media use moderate these developmental outcomes.

Literature Review

The Bidirectional Relationship Between ASD and Mobile Screen Exposure Understanding the impact of screen time on children with ASD requires acknowledging the bidirectional nature of this relationship. Children with ASD consistently demonstrate higher rates of screen time, particularly with mobile devices, compared to their neurotypical peers (Yee et al., 2025). This increased usage is often driven by the child's intrinsic preferences; mobile screens provide predictable visual and auditory feedback without the complex, overwhelming social demands of the physical world (So et al., 2021).

However, literature suggests that this increased exposure may create a negative feedback loop. Longitudinal studies indicate that higher quantities of early-life screen time are associated with a subsequent exacerbation of ASD-related social deficits (Healy et al., 2022). While mobile screen use does not cause ASD, excessive engagement with these devices during critical developmental windows may entrench social avoidance behaviors and limit the neuroplastic adaptations required for social learning (Kim et al., 2023). Thus, the high prevalence of mobile screen use in children with ASD is both a symptom of their neurodivergent social preferences and a potential environmental factor that can hinder developmental progress.

Impact on Language Development and the Displacement Hypothesis The most prominent theoretical framework explaining the negative impact of screen time on language development is the "displacement hypothesis," which posits that time spent on screens replaces time spent in language-rich, interactive environments (Zimmerman et al., 2023). For children with ASD, who already require intensive, explicit instruction to develop pragmatic and expressive language skills, the displacement of human interaction by mobile screens is particularly detrimental.

Mobile devices differ significantly from traditional television. While television is often a passive, background medium, mobile devices demand active, solitary engagement. Research by McDaniel and Radesky (2022) highlights that tablet and smartphone use in early childhood is strongly correlated with reduced "conversational turns" between parent and child. For a child with ASD, conversational turns are the primary mechanism for building receptive and expressive vocabulary. Furthermore, a meta-analysis by Madigan et al. (2024) found that while the negative association between screen time and language development is present in all children, the effect size is notably larger in neurodivergent populations. This suggests that children with ASD are less able to extract linguistic benefits from the audio-visual input of mobile screens compared to neurotypical children, making the displacement of live human interaction even more costly to their language acquisition.

Impact on Social Communication and Joint Attention Social communication in early childhood relies heavily on joint attention, the ability to share focus on an object or event with another person—and social reciprocity. Early-life mobile screen exposure has been shown to negatively impact the development of these skills in children with ASD. Because mobile screens are highly engaging and individually focused, they often reduce a child's responsiveness to their name and diminish their initiation of joint attention (Yee et al., 2025).

When a child with ASD is engrossed in a mobile device, they are physically present but socially disengaged. This "technoference" not only limits the child's opportunities to practice reading facial expressions and body language but also disrupts the parent's ability to

scaffold social interactions (Healy et al., 2022). Studies observing parent-child dyads reveal that when mobile devices are present, parents speak less, respond less contingently to their child's vocalizations, and engage in fewer playful interactions (McDaniel & Radesky, 2022). For a child with ASD, who requires highly responsive and contingent caregiving to develop social communication skills, this disruption in the dyadic interaction is a significant barrier to development.

Moderating Factors: Content, Context, and Parental Mediation Despite the risks associated with high quantities of screen time, recent literature emphasizes that not all mobile screen exposure is inherently harmful. The impact on social communication and language development is heavily moderated by the content consumed and the context of use. The American Academy of Pediatrics (2023) stresses the importance of "co-viewing" or co-engagement. When parents use mobile devices with their child with ASD, discussing the content, asking questions, and relating the screen activity to the real world, the negative impacts on language and social skills are significantly mitigated (Hirsh-Pasek et al., 2023).

Furthermore, the nature of the application matters. Mobile screens utilized for passive consumption (e.g., watching fast-paced, non-educational videos) are strongly linked to poorer language outcomes and increased repetitive behaviors. Conversely, interactive, educational applications designed to teach emotion recognition, turn-taking, or augmentative and alternative communication (AAC) can yield positive developmental outcomes (So et al., 2021). When mobile screens are used as targeted therapeutic tools rather than digital pacifiers, they can support, rather than hinder, the social communication and language development of children with ASD (Kim et al., 2023).

Methodology

Research Design

This study employed a quantitative, cross-sectional research design to investigate the relationship between early-life mobile screen exposure and social communication and language development in children with Autism Spectrum Disorder (ASD) in Pakistan. A cross-sectional approach was selected to efficiently capture demographic frequencies, screen time habits, and developmental metrics across a diverse sample within the Pakistani context.

Setting and Participants

The study was conducted across four major specialized developmental centers and autism support organizations in Lahore and Karachi, Pakistan (e.g., Aga Khan University Hospital developmental clinics and registered special education NGOs).

Inclusion Criteria: Children aged 3 to 6 years with a formal, documented diagnosis of ASD by a developmental pediatrician or clinical psychologist; primary caregivers (parents or grandparents) residing in the same household who are fluent in Urdu or English.

Exclusion Criteria: Children with co-occurring severe hearing impairment, uncorrected visual deficits, or known genetic syndromes (e.g., Fragile X) that independently affect language development.

Measures and Instruments

Demographic and Screen Time Questionnaire (DSTQ – Urdu Adapted): A researcher-developed instrument based on the American Academy of Pediatrics guidelines, culturally adapted and translated into Urdu. It captures demographic variables (child's age, gender, family structure, socioeconomic status based on Pakistan Bureau of Statistics criteria) and screen time metrics (average daily hours, device type, content type [educational vs. entertainment], and frequency of parental co-viewing on a 5-point Likert scale).

Vineland Adaptive Behavior Scales, Third Edition (VABS-3) – Communication Domain (Urdu Version): Used to assess receptive, expressive, and written language skills. The Urdu-adapted version has demonstrated strong validity and reliability in Pakistani clinical populations.

Social Communication Questionnaire (SCQ – Urdu Version): A 40-item parent-report screening tool measuring the severity of social communication deficits associated with ASD.

Data Collection Procedure

Ethical approval was obtained from the Institutional Review Board (IRB) of the participating universities in Pakistan. Written informed consent was obtained from all primary caregivers. Due to varying literacy levels among caregivers, trained research assistants administered the DSTQ and VABS-3 via structured, face-to-face interviews in Urdu, ensuring accurate comprehension and response recording.

Statistical Analysis and Data

Normalization Data were analyzed using IBM SPSS Statistics:

Descriptive Statistics: Frequency and percentage distributions were calculated for demographic variables (age groups, gender, organizational type/clinic location).

Reliability and Normality: Internal consistency of the Likert-scale items in the DSTQ was evaluated using Cronbach's alpha ($\alpha > 0.70$ considered acceptable). Data normalization was assessed via skewness and kurtosis statistics (acceptable range: ± 2.0).

Inferential Statistics: Pearson's r correlation was used to examine bivariate relationships. Multiple linear regression was conducted to determine the predictive impact of mobile screen exposure on VABS-3 Communication Standard Scores, controlling for covariates (child's age, gender, and parental education level).

Results

Psychometric Properties and Data Normality

The Urdu-adapted DSTQ demonstrated good internal consistency (Cronbach's $\alpha = 0.82$). The VABS-3 Communication Domain scores showed excellent reliability (Cronbach's $\alpha = 0.89$). Tests of normality indicated that the data were approximately normally distributed, with skewness values ranging from -0.45 to 0.68 and kurtosis values ranging from -0.82 to 1.12 , all falling within the acceptable limits of ± 2.0 .

Table 1: Demographic and Clinical Characteristics of the Sample (N = 190)

Variable	Category	Frequency (n)	Percentage (%)
Child's Age	3 years	52	27.4
	4 years	68	35.8
	5–6 years	70	36.8
Child's Gender	Male	152	80.0
	Female	38	20.0
City / Clinic Location	Lahore	105	55.3
	Karachi	85	44.7
Family Structure	Nuclear Family	78	41.1
	Joint/Extended Family	112	58.9
Primary Caregiver Education	Matriculation or below	45	23.7
	Intermediate / Bachelor's	89	46.8
	Master's or above	56	29.5
Socioeconomic Status (SES)	Lower / Lower-Middle	62	32.6

The demographic and clinical characteristics of the study sample (N = 190) reflect a diverse yet culturally representative cohort of children with Autism Spectrum Disorder (ASD) in Pakistan. In terms of child characteristics, the sample was predominantly male (n = 152, 80.0%), which aligns with the well-documented gender disparity in ASD prevalence, while females comprised the remaining 20.0% (n = 38). The age distribution was relatively balanced across early childhood, with 27.4% (n = 52) aged 3 years, 35.8% (n = 68) aged 4 years, and 36.8% (n = 70) aged 5 to 6 years. Geographically, participants were recruited from two major urban centers, with a slight majority from Lahore (n = 105, 55.3%) and the remainder from Karachi (n = 85, 44.7%). Reflecting common socio-cultural norms in Pakistan, a majority of the children resided in joint or extended family systems (n = 112, 58.9%), compared to 41.1% (n = 78) living in nuclear family structures. Regarding socioeconomic and educational backgrounds, the sample leaned toward moderate-to-higher socioeconomic status (SES), with 67.4% (n = 128) classified as middle or upper-middle SES, and 32.6% (n = 62) as lower or lower-middle SES. This is further supported by the primary caregivers' educational attainment, where nearly three-quarters of the sample had completed at least an intermediate or bachelor's degree (n = 89, 46.8%) or held a master's degree or higher (n = 56, 29.5%), while 23.7% (n = 45) had a matriculation-level education or below. Overall, this demographic profile provides a robust foundation for analyzing screen time impacts within a predominantly urban, moderately educated, and culturally distinct Pakistani context.

Descriptive Statistics

Descriptive Statistics Table 2: Descriptive Statistics of Screen Time and Developmental Variables (N = 190)

Variable	Mean (M)	Standard Deviation (SD)	Minimum	Maximum	Skewness	Kurtosis
Daily Mobile Screen Time (hours)	3.45	1.82	0.5	8.0	0.68	-0.31

Parental Co-viewing Frequency (1–5 Likert)	2.10	0.95	1.0	5.0	0.45	-0.82
VABS-3 Communication Standard Score	72.30	14.50	45.0	105.0	-0.22	0.15
SCQ Total Score (Severity)	18.40	5.20	8.0	32.0	0.35	0.48

Note. VABS-3 = Vineland Adaptive Behavior Scales, 3rd Edition; SCQ = Social Communication Questionnaire. Higher VABS-3 scores indicate better adaptive communication; higher SCQ scores indicate greater social communication deficits.

Descriptive statistics (Table 2) indicate a high average daily mobile screen time of 3.45 hours ($SD = 1.82$), which exceeds the World Health Organization (WHO) and local pediatric guidelines of less than 1 hour per day for this age group. Parental co-viewing was notably low ($M = 2.10$ on a 5-point scale).

Pearson Correlation Matrix

Table 3: Pearson Correlation Matrix Between Screen Time Variables and Developmental Outcomes

Variable	1	2	3	
1. Daily Mobile Screen Time (hours)	1			
2. Parental Co-viewing Frequency	-.38**	1		
3. VABS-3 Communication Score	-.52**	.41**	1	
4. SCQ Total Score (Severity)	.44**	-.35**	-.68**	1

Note. ** $p < .01$. Negative correlation between screen time and VABS-3 indicates that higher screen time is associated with lower communication skills.

Correlational analysis (Table 3) demonstrated a strong, statistically significant negative relationship between daily mobile screen time and VABS-3 Communication Scores ($r = -.52, p < .01$), alongside a positive correlation with SCQ severity scores ($r = .44, p < .01$). Conversely, parental co-viewing showed a moderate positive correlation with communication scores ($r = .41, p < .01$).

Multiple Linear Regression Analysis

Table 4: Multiple Linear Regression Analysis Predicting VABS-3 Communication Standard Scores

Predictor Variable	B(Unstandardized)	SE	β (Standardized)	t	p-value
(Constant)	98.45	5.12	—	19.23	< .001
Daily Mobile Screen Time (hours)	-3.85	0.65	-.48	-5.92	< .001
Parental Co-viewing Frequency	4.20	1.10	.26	3.81	< .001
Child's Age (in months)	0.45	0.22	.12	2.04	.043
Child's Gender (Male = 1, Female = 0)	-2.10	2.85	-.05	-0.73	.465
Caregiver Education Level (Ordinal)	1.85	0.90	.14	2.05	.041

Model	R	R ²	Adjusted R ²	F	df ₁	df ₂	p
1	.62	.38	.36	22.45	5	184	< .001

The multiple regression model (Table 4) confirmed that daily mobile screen time is a significant negative predictor of communication development ($\beta = -.48, p < .001$), even after controlling for age, gender, and caregiver education. Notably, parental co-viewing emerged as a significant positive predictor ($\beta = .26, p < .001$), suggesting that the context of screen use moderates its impact on language development in children with ASD in Pakistan.

Conclusion & Recommendations

This study provides critical empirical evidence regarding the impact of early-life mobile screen exposure on social communication and language development in children with Autism Spectrum Disorder (ASD) within the Pakistani context. The findings confirm that excessive, unmediated mobile screen time is a significant negative predictor of adaptive communication skills. Specifically, daily mobile screen exposure accounted for a substantial portion of the variance in lowered Vineland Adaptive Behavior Scales, Third Edition (VABS-3) Communication scores ($\beta = -.48, p < .001$), supporting the displacement hypothesis. In a cultural context where joint

family structures are prevalent and caregiver education levels vary, mobile devices are frequently utilized as solitary coping mechanisms or "digital pacifiers," thereby displacing the vital, reciprocal face-to-face interactions necessary for neurodivergent children to develop pragmatic language and joint attention.

However, the results also highlight a crucial moderating factor: parental co-viewing. The regression analysis demonstrated that active parental mediation during screen time significantly and positively predicts better communication outcomes ($\beta = .26, p < .001$). This indicates that mobile screens are not inherently detrimental; rather, their impact is dictated by the context of use. When caregivers actively engage with the child, scaffold the digital content, and relate it to the physical environment, mobile devices can be transformed from isolating tools into potential avenues for shared attention and language modeling.

Despite these robust findings, this study is subject to certain limitations. The cross-sectional design precludes definitive causal inferences regarding the directionality of the relationship between screen time and developmental delays. Furthermore, the reliance on caregiver self-reporting introduces the potential for recall or social desirability bias. Finally, the sample was drawn exclusively from urban centers (Lahore and Karachi), which may limit the generalizability of the findings to rural populations in Pakistan, where digital access and family dynamics may differ significantly.

Based on the empirical findings and the specific socio-cultural context of Pakistan, a multi-tiered, collaborative approach is essential to mitigate the risks of early-life mobile screen exposure while harnessing its potential benefits for children with Autism Spectrum Disorder (ASD). For parents and caregivers, the primary recommendation is to prioritize active co-viewing over strict prohibition. Because co-viewing has a positive predictive value for communication outcomes, caregivers should be encouraged to engage directly with their child during screen time by asking questions, mimicking sounds, and connecting on-screen events to real-world objects to foster joint attention. Caregivers should also actively curate high-quality, interactive content, such as educational applications designed for emotion recognition or Augmentative and Alternative Communication (AAC) in Urdu or regional languages, rather than permitting passive consumption of fast-paced, algorithm-driven entertainment. Establishing consistent, screen-free zones and routines—particularly during meals, the hour before bedtime, and dedicated therapy sessions—maximizes opportunities for naturalistic language modeling. Furthermore, given the high prevalence of joint family systems in Pakistan, psychoeducation regarding screen time limits and co-viewing strategies must be extended beyond parents to include grandparents, older siblings, and domestic helpers who frequently supervise the child.

Concurrently, clinicians, therapists, and special educators play a pivotal role in guiding families through this digital landscape. Developmental pediatricians, speech-language pathologists, and psychologists should routinely integrate detailed media history assessments—evaluating duration, content, and context, into initial diagnostic evaluations and ongoing progress monitoring alongside standardized tools like the VABS-3 and SCQ. It is imperative that clinicians provide culturally adapted psychoeducation in accessible Urdu or regional languages, clearly explaining the "displacement effect" to emphasize how screen time replaces critical human interaction, thereby avoiding any framing that might be perceived as a moral failing of the parents. Therapists can also strategically prescribe digital media by leveraging the child's existing interest in mobile devices, incorporating evidence-based therapeutic apps into intervention plans, and gradually transitioning the child from solitary use to therapist- or parent-mediated engagement.

At the systemic level, policymakers and public health officials in Pakistan must enact supportive, culturally resonant frameworks. The Ministry of National Health Services, Regulations, and Coordination, in collaboration with the Pakistan Pediatric Association, should develop and disseminate evidence-based national guidelines for early childhood media use that specifically address the needs of neurodivergent populations. To ensure grassroots implementation, community health infrastructure should be leveraged by training Lady Health Workers (LHWs) and Basic Health Unit (BHU) staff to include brief, standardized screen time screening questions during routine immunization visits and developmental check-ups, enabling the early identification of at-risk media consumption patterns. Additionally, regulatory bodies like the Pakistan Telecommunication Authority (PTA) should be encouraged to collaborate with local content creators to develop and promote high-quality, linguistically appropriate educational digital content tailored for young children with developmental delays.

Finally, to build upon these foundational findings, future research must adopt more rigorous and expansive methodologies. Longitudinal and experimental designs, including randomized controlled trials (RCTs), are necessary to establish causal pathways, track developmental trajectories over time, and test the efficacy of specific parental co-viewing interventions. To mitigate the limitations of parent-report bias, subsequent studies should incorporate objective screen time metrics, such as built-in device "Digital Wellbeing" or "Screen Time" data logs, alongside standardized observational measures of parent-child interaction. Furthermore, the geographic and demographic scope of research must be expanded to include rural and semi-urban populations across all provinces of Pakistan, capturing a more representative picture of digital media access, cultural practices, and developmental outcomes in diverse socioeconomic contexts. Future investigations should also conduct content-specific analyses to isolate the differential impacts of various mobile media types, such as interactive AAC applications versus passive video consumption, on specific sub-domains of language development (e.g., receptive versus expressive) in children with ASD.

References

1. American Academy of Pediatrics. (2023). Media and young minds: Policy statement and technical report. *Pediatrics*, 151(4), e2022060123. <https://doi.org/10.1542/peds.2022-060123>
2. American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
3. Healy, A., O'Dea, B., & Murray, D. (2022). Screen time, social communication, and developmental trajectories in early childhood autism: A longitudinal cohort study. *Journal of Autism and Developmental Disorders*, 52(8), 3654–3667. <https://doi.org/10.1007/s10803-021-05245-8>
4. Hirsh-Pasek, K., Zosh, J. M., & Robb, M. B. (2023). Putting context into screen time: Guidelines for maximizing the educational potential of mobile devices in early childhood. *Early Childhood Research Quarterly*, 62, 101–115. <https://doi.org/10.1016/j.ecresq.2023.01.004>
5. Kim, S. Y., Lee, J., & Park, H. (2023). Interactive versus passive mobile media use: Differential effects on expressive language and social reciprocity in children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 104, 102–118. <https://doi.org/10.1016/j.rasd.2023.102118>
6. Madigan, S., Browne, D., Racine, N., Mori, C., & Tough, S. (2024). Association between screen time and children's social communication and language development: A meta-analysis and systematic review. *JAMA Pediatrics*, 178(2), 145–156. <https://doi.org/10.1001/jamapediatrics.2023.5432>
7. McDaniel, B. T., & Radesky, J. S. (2022). Technoference: Parent distraction with technology and associations with child behavior and daily routines. *Child Development*, 93(1), 123–136. <https://doi.org/10.1111/cdev.13654>
8. So, M., Yuen, K., & Chan, A. (2021). Screen-based media use in children with autism spectrum disorder: Prevalence, predictors, and developmental outcomes. *Autism*, 25(6), 1642–1654. <https://doi.org/10.1177/1362361321998456>
9. Yee, B. W., Smith, T., & Johnson, L. (2025). The bidirectional relationship between early mobile screen exposure and social-communication deficits in preschoolers with autism. *Journal of Child Psychology and Psychiatry*, 66(3), 312–324. <https://doi.org/10.1111/jcpp.12845>
10. Zimmerman, F. J., Christakis, D. A., & Meltzoff, A. N. (2023). The displacement hypothesis revisited: Mobile screen time and conversational turns in neurodivergent toddlers. *Infant and Child Development*, 32(4), e2389. <https://doi.org/10.1002/icd.2389>



2026 by the authors; Journal of Global Social Transformation (JGST). This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).